THE PAPER INDUSTRY and PAPER WORLD

VOLUME 21 **NUMBER 8** **NOVEMBER, 1939**

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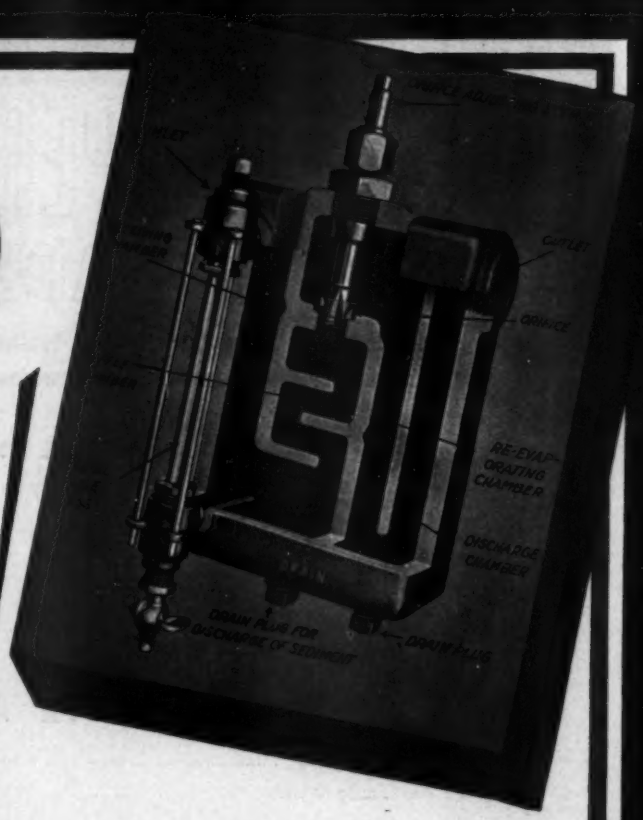

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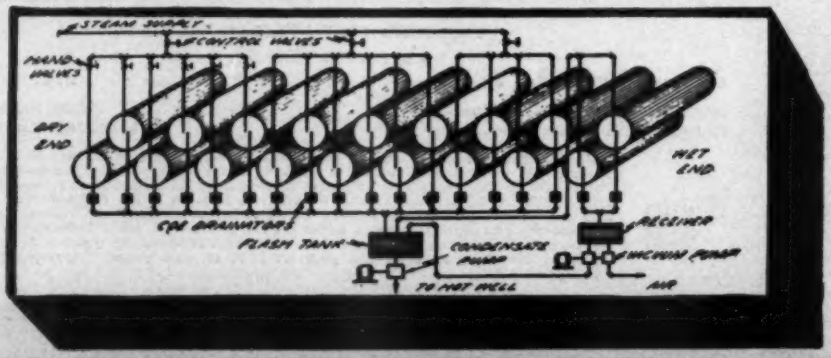
1. No by-passes, no air vents, no moving parts to wear. Simplified piping.
2. All air and condensate eliminated from each dryer independently.
3. Operates on any pressure or vacuum.
4. Condenses all flash steam, assuring low steam consumption.
5. Provides complete steam pressure control.
6. Gauge glass on each dryer so operator can observe drainage flow.

To be successful a dryer drainage system must be simple, trouble-free, responsive to variations in pressure or vacuum. To install anything of a complicated design is only to invite trouble somewhere.

In the Coe, you have such a system—simplicity, adaptability to changing pressures and vacuums—a system you can install and let alone with complete assurance that it will do its job.

Shartle has gone Coe, and without hesitation. Shartle urges the installation of Coe Drainators—not only on paper machines but also on corrugating machines, digesters, etc.

Layouts and estimates direct from Shartle at no cost to the mill.



Black-Clawson-Shartle

ADVERTISING PAGES REMOVED

TRADE WINDS

WAGES AND HOURS

▸▸▸ THE AMERICAN PAPER AND PULP ASSOCIATION has sent to all members a copy of the final determination of Secretary of Labor Frances Perkins setting minimum wage rates in the pulp and paper industry under the provisions of the Walsh-Healey Act. These rates (which are listed on this page) went into effect October 15, 1939, but they do not apply upon contracts now in effect regardless of the period of time covered by such contracts.

Following are excerpts from the Secretary of Labor's final determination, which contain salient details of this new minimum wage scale:

"On June 8, 1939, the Administrator, Division of Public Contracts, circularized the Board's recommendations in order that all parties might have full opportunity to register their objection or approval before a decision in the matter was made by the Secretary of Labor. Several briefs were filed expressing approval of or objection to the Board's recommendations. A brief objecting to the recommendations was filed by the American Paper and Pulp Association in behalf of the industry. This brief alleged that the definition of the industry as contained in the Board's recommendations was too restrictive; that the industry did and does have an apprenticeship, learner and handicapped worker problem and may wish to establish a need for a tolerance for such workers at a subsequent time; that the wage structure in the industry warrants the establishment of a central zone lying between the Northern and Southern regions in accordance with the grouping made under the National Recovery Administration; that the Pacific Coast States should be grouped with the Northern States for purposes of a minimum wage determination; and that the recommendations did not give sufficient consideration to the minimum wage paid to female workers in the industry.

"The evidence of record appears to show adequately the wage structure in the industry which is engaged in the manufacture of pulp and other fiber, and the primary conversion of pulp and other fiber into paper and paperboard, and in addition, the manufacture and conversion of primary paper into toilet paper and paper towels, coated book paper and paper shipping sacks. It was alleged by the National Paperboard Association that the wage survey did not include the manufacture of certain paperboard items. The record shows, however, that the prevailing wage in the manufacture of such paperboard is similar to that prevailing in the manufacture of paper and the paperboard covered by the survey.

"For this reason and for the further reason that it is not possible to segregate properly by definition the paperboard products referred to by the National Paperboard Association, such products will be regarded as within the industry as defined for this determination. If the companies manufacturing any paperboard items not covered by the survey should in the future be deprived of government contracts because of this wage determination, they will be given another opportunity to file complete information with the Department for further consideration.

"The evidence of record indicates that there are approximately 125,000 production workers in the industry as defined. The survey covered approximately 90,000 such workers, or 80 per cent of the total employees in the industry. It appears that this survey adequately shows the wage structure existing in the industry.

"Slightly over 27,000 workers are reported as receiving base rates. This number includes the employees of the industry receiving minimum wages and constitutes ample basis for finding the prevailing minimum wage in the industry.

"A tabulation of the base rates shows appreciable wage differentials in different sections of the country. The Southern States show lower wage rates in general than the Northern States, while the highest rates are found in the far West."

Determination of Minimum Wage Rates

The minimum wage for employees engaged in the performance of contracts with agencies of the United States Government subject to the provisions of the Act of June 30, 1936 (49 Stat. 2036; 41 U.S.C. Sup. III 35) for the manufacture or furnishing of pulp and other fiber and the primary conversion of pulp and other fiber into paper and paperboard, and in addition, the manufacture and conversion of primary paper into toilet paper and paper towels, coated book paper and paper shipping sacks, is to be the amount indicated for each of the following groups of States:

SOUTHEAST—35 cents an hour or $14 per week of 40 hours, arrived at either upon a time or piece-work basis. (States of Virginia, North Carolina, South Carolina, Georgia, Alabama, Tennessee, Kentucky, Mississippi, Louisiana, Arkansas, Oklahoma, Florida, and Texas.)

NORTH—39 cents an hour, or $15.60 per week of 40 hours, arrived at either upon a time or piece-work basis. (States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Ohio, Indiana, Michigan, Wisconsin, Illinois, Missouri, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, New Mexico, Colorado, Wyoming, Montana, Idaho, Utah, Arizona, Nevada, and the District of Columbia.)

PACIFIC COAST—50 cents an hour, or $20 per week of 40 hours, arrived at either upon a time or piece-work basis.

SEEK AMERICA'S "MODERN PIONEERS"

"Modern Pioneers" — those inventors who have contributed most to the American standard of living in the last 25 years will be honored on February 27 at a celebration in New York sponsored by the National Association of Manufacturers. The celebration will commemorate the 150th anniversary of the founding of the American Patent System.

Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, heads a committee of six eminent scientists named to select the "Modern Pioneers." In addition to Dr. Compton, the awards committee includes Forest R. Moulton, American Association for Advancement of Science; George B. Pegram, Columbia University; John T. Tate, University of Minnesota; Edward E. Weidlein, Mellon Institute, and Frank C. Whitmore, Pennsylvania State College.

Simultaneous with the appointment of the awards committee, the N.A.M.,

in co-operation with scientific organizations, launched its search for the nation's most outstanding scientists and inventors. Trade groups, manufacturers and scientific societies were asked to nominate persons for distinction as "Modern Pioneers." This search for outstanding men in science will reach its climax at a banquet at the Waldorf-Astoria in New York on February 27 when awards will be presented to the selected persons. This program will be broadcast over a nation-wide radio hook-up.

Among the members of the committee commissioned to sponsor a search for the nation's outstanding inventor or research worker are: R. A. Hayward, president of the Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan; Joseph Rossman, patent attorney, Marathon Paper Mills Company, Rothschild, Wisconsin, and J. D. Zellerbach, president of the Crown Zellerbach Corporation, San Francisco.

◆

TECH SCHOOLS CONSOLIDATE

Two well-known technological institutions, the Armour Institute of Technology and the Lewis Institute, both of Chicago, will consolidate to form the Illinois Institute of Technology, it was revealed recently.

Under the consolidation, a completely new institution will be constructed. It is not known as yet where the new campus will be located, although it has been stated that it will be adjacent to Chicago's loop area. The faculties will be merged next September.

Armour Institute was founded in 1892 by Philip D. Armour, Chicago packer, who contributed more than $2,650,000 to the school. Lewis Institute was endowed by Allan C. Lewis, prominent Chicago real estate man, in 1892.

◆

KVP DEVELOPS NEW TYPE PAPER

A new type paper, especially designed for milk bottle hoods, has been developed by the Kalamazoo Vegetable Parchment Company, Parchment, Kalamazoo, Michigan.

The new development, which has resulted from two years of experimentation by the company's sales, research and manufacturing departments, permits dairies to apply the hoods mechanically. A special machine, developed by a manufacturer in the East, is used to apply the new KVP sheet. A special tape is used to hold the hood in place and make it tamper-proof. The report of the new development, as released through the company's *Parchment News*, stated that the inherent purity, insolubility and waterproofness of the new hood was quickly recognized by one of the local dairies and they are now using the new paper as a hood on all of their milk.

◆

OLD-TIMERS MARK GAIR CENTENARY

The centenary of the birth of Robert Gair, founder of the Robert Gair Company, Inc., was celebrated at the seventh annual banquet of the Gair Old-Timers Association on the evening of October 21 in the grand ballroom of the Hotel New Yorker, New York City.

The association was founded in memory of Robert Gair by those who had, at one time or another, worked for Mr. Gair or his company for a period of ten years. Each year the attendance at the annual dinner has been over one hundred and this year the number was 125. The Old Timers were addressed by George W. Gair, chairman of the board and honorary chairman of the association, who related many interesting bits of Robert Gair's life and incidents in the early history of the company which is seventy-five years old this year (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 541, Aug. 1939).

◆

GLATFELTER MARKS ITS 75TH YEAR

"Seventy-five years ago an enterprising young man after one year's business experience went into debt to purchase a rather forlorn looking paper mill in Southern Pennsylvania. How that mill has been developed during the past seventy-five years is briefly told on the following pages."

Thus begins the story of the P. H. Glatfelter Company of Spring Grove, Pennsylvania, as related in the booklet recently published on the occasion of the well-known company's seventy-fifth anniversary — *Seventy-five Years of Paper Making*. The booklet traces the development of the Glatfelter organization from its inception in 1864 to its present state of development, relating the mill's first production and its gradual growth throughout the years. Of special interest are the portraits and biographical sketches of the three generations of Glatfelters who have controlled the company.

In addition to the interesting story of the Glatfelter company, this splendidly-prepared publication also includes an extremely well-done section called a "Short Course in Paper Making." This latter section not only gives the history of papermaking but illustrates by use of excellent photographs and well-written literature, the actual procedure of papermaking as accomplished in the Glatfelter company. Of particular interest is the "paper making flow chart" which shows, in order, the evolution of wood to paper.

Both from the viewpoint of interest and specific information the booklet is a fitting tribute to the men and organization of the P. H. Glatfelter Company.

◆

PACKAGING INST. HAS FIRST MEET

The first annual meeting of Packaging Institute, Inc., was held October 19-20 at the Edgewater Beach Hotel, Chicago. William M. Bristol, Jr., of Bristol-Myers Company, was elected president and Carl H. Lambelot, New Jersey Machine Corporation, was named vice president. The conclave recommended a plan to act as an authoritative agency on packaging technique, to promote better packaging, inform the public of its benefits and to serve as a contact agency in matters involving standardization and regulation of packaging technique. E. A. Throckmorton of the Container Corporation of America was named a member of the supplies division committee.

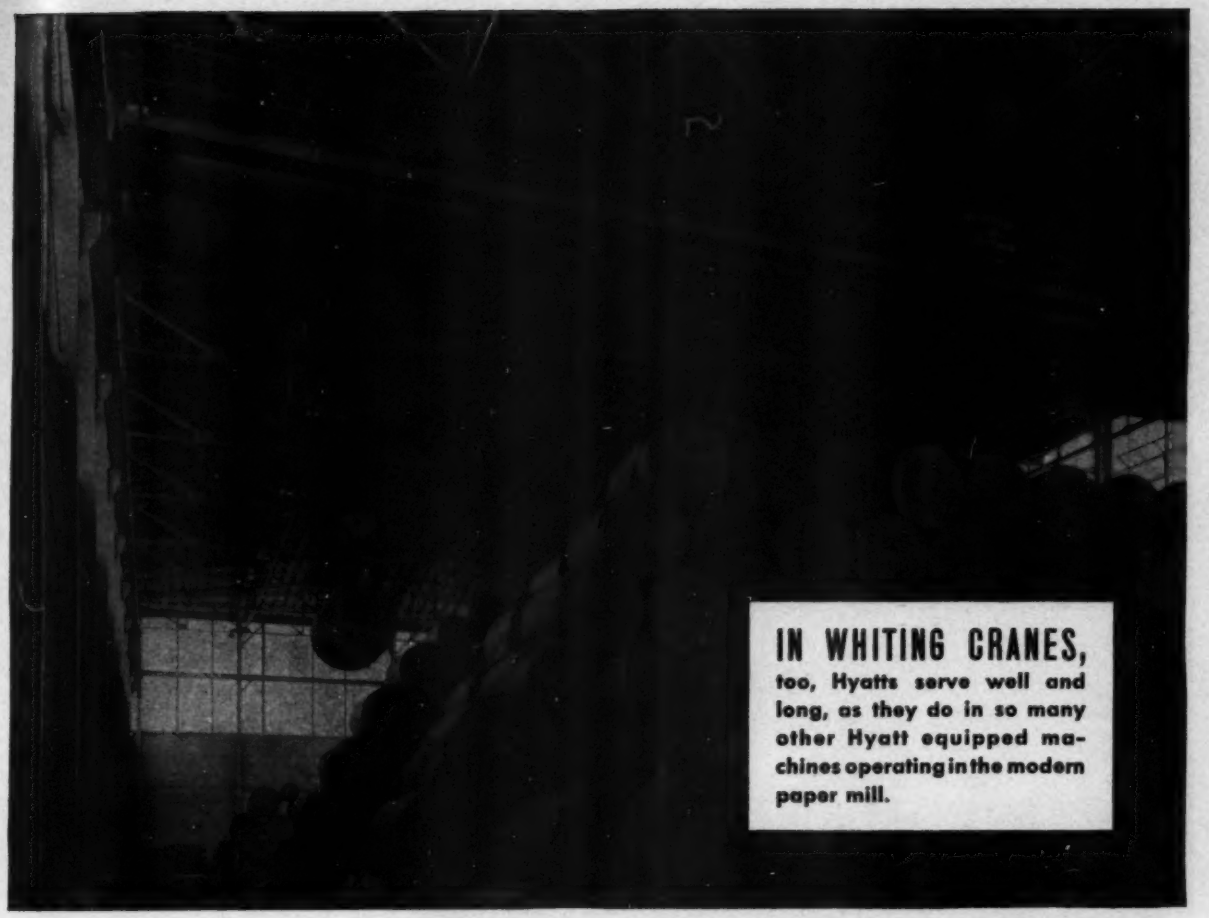
◆

RAYONIER GETS JAPANESE ORDER

Rayonier, Incorporated, has received orders from Japanese customers for 21,500 tons of dissolving pulps, it was announced recently by J. D. Zellerbach, executive vice president. Delivery schedules call for completion of shipments by the end of February, 1940.

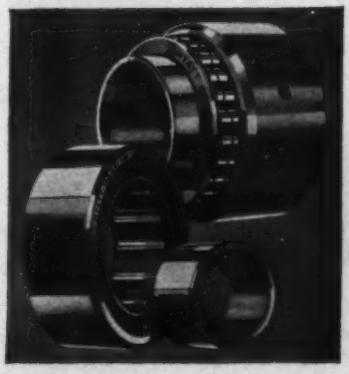
This order was the first received by Rayonier from the Japanese since June, 1939, at which time 16,800 tons were ordered to be delivered before the end of the year. Subsequently, shipping schedules were accelerated to provide for the complete delivery by the end of the current month. War conditions, affecting exports of dissolving pulps from Scandinavian countries, are believed responsible for the the Japanese order.

Rayonier is, at present, erecting a sulphite pulp mill at Fernandina, Florida, where, it is reported, construction work is nearing completion.


IN WHITING CRANES,
too, Hyatts serve well and long, as they do in so many other Hyatt equipped machines operating in the modern paper mill.

Built In Bearing Security

HYATT ROLLER BEARINGS rotate so smoothly, so accurately, so efficiently that they are called upon to play an essential role in the smooth functioning of all mechanical equipment. Design engineers know from experience that Hyatts on gears, shafts and wheels bring a lifetime of dependable performance to their products. Thus to builders of mechanical equipment Hyatt offers advantages of design . . . to the purchaser Hyatts bring quiet, carefree, economical operation. Be secure . . . with Hyatt Roller Bearing protection. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J.; Chicago, Pittsburgh, Detroit and San Francisco.



HYATT ROLLER BEARINGS

NEW EQUIPMENT IN PLANT OF PROVINCIAL PAPER CO.

Above—Coater. Man on right stands beside telephone connected to all department operators of the machine and emergency instructions, etc. are delivered this way . . . Center—Back view of machine or dryer shell . . . Below—Winding equipment.

▸▸▸ A MAJOR DEVELOPMENT in Canadian papermaking is the installment of a new coater and dryer in the Provincial Paper Limited's Georgetown (Ontario) mills. The new equipment, valued at $100,000, is said to embody revolutionary improvements which eliminate many of the unknown or uncontrollable factors in the coating and drying of printing papers. Largest in Canada, this new type equipment has a capacity of 50,000 pounds per day.

No brushes are used on paper produced by this new machinery and consequently the paper contains no brush marks. The coating is applied by rollers and the weight of coating is constantly under scientific control. A large airbrush prevents defects in the smoothness of the coating surface. As the stock comes through the rollers, air is forced through the brush at great pressure, smoothing out any microscopic bumps which may exist. Stick marks are also non-existent.

The coated stock enters the new dryer on a straight line; is dried in less than 20 seconds; and rolls out on a straight line. The high-speed drying is made possible by controlled steam heat which hits the stock from all directions the moment it enters the drying chamber. The heat is at a constant level and is thermostatically controlled along the entire 250-foot length of the dryer.

◆

▸▸▸ THE RISING PAPER COMPANY is about to construct an addition to its mills at an estimated cost of $75,000, it was reported recently.

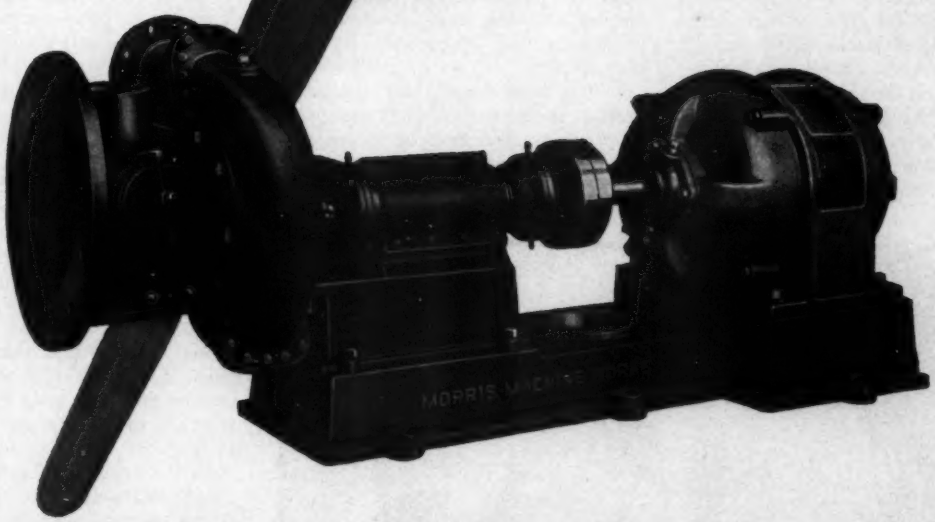
◆

THILMANY TAKES LEASE ON OLD UNION BAG UNIT

The Thilmany Pulp and Paper Company, Kaukauna, Wisconsin, has taken a five to ten year lease on the old Union Bag and Paper Company unit which is located adjacent to the Thilmany property. The addition is to be used as a converting plant, warehouse and store room.

The Green Bay and Mississippi Canal Company, owners of the building which was vacated by the bag company several years ago, are remodeling the structure and are renovating it to suit the new tenants. The major portion of the building will be given over to the conversion of the paper.

A new advance



in pump design for heavy stock

guaranteed non-binding

THE Morris ST-P Stock Pump completely solves two difficult problems in pulp and paper mills—the pumping of heavy machine feed and of raw waste paper stock.

These pumps have successfully handled foaming pulp of more than 6% consistency. They are delivering heavy stock at a constant rate without dehydrating and with varying heads, and are handling raw waste stock without wedging of foreign matter between impeller and casing.

Mill superintendents report that Morris ST-P Stock Pumps give more uniform flow . . . better control of stock . . . more reliable service . . . more complete freedom from trouble, than any pumps they previously used.

The features of this important advance in heavy stock pump design are graphically explained in bulletin, which will be sent on request.

MEMBER

MORRIS MACHINE WORKS . . . . Baldwinsville, N. Y.

Branches in principal industrial centers—Export Office, 30 Church St., N. Y.

MORRIS CENTRIFUGAL PUMPS

for every pulp and paper mill service

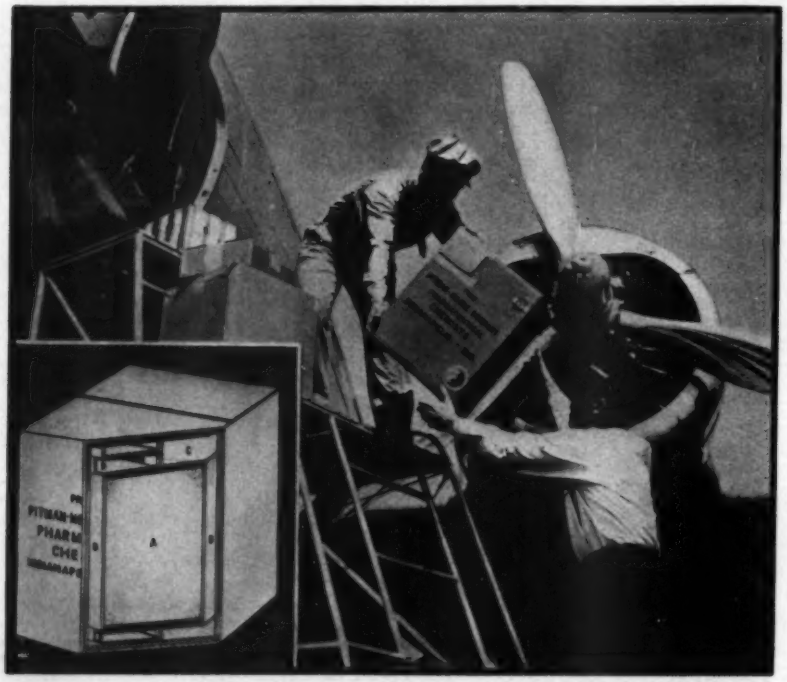
NEW CONTAINER CORP. CARTON IS DEVELOPED

A new type of refrigerator carton to facilitate safe as well as speedy handling of serums, vaccines and other perishable biological products has been developed by Container Corporation of America. The new carton, which allows the product to be packed with dry ice, was developed to meet the needs of Pitman-Moore Company of Indianapolis and already has been placed in use in the shipping of animal vaccines. In this carton biologicals can be shipped by express to any part of the United States at a constant temperature of from 32 degrees to 42 degrees.

The carton, developed at Container's Anderson, Indiana, plant carries a maximum of three pounds of dry ice, sufficient to maintain low temperature to destination several thousand miles away.

The dry ice is first wrapped in heavy kraft paper and then placed in a bunker at the top of the carton. The product itself is carried in an inner shell, with air space on all sides to allow circulation of the fumes from the dry ice. The inner carton is suspended by pads at the top, bottom, and corners.

It has been found that the temperature in the walls of the carton may go as low as 28 degrees or 30 degrees, but that the inner carton prevents a freezing temperature around the product itself.



Airport attendants are shown handling one of the dry ice cartons developed by Container Corp. of America to insure safe shipment of vaccines and other perishable biological products. The carton (shown in insert above) illustrates the space for product (A); air space for circulation of ice fumes (B); bunker for dry ice (C), and pads for suspension of inner carton (D).

NEW ENGLAND PULP NEWS

Offerings of high grade bleached sulphite at $57 per ton exdock for shipment from Scandinavian countries and of unbleached sulphite at $48 per ton are indicative of how sellers appraise some of their better pulps. Of course some of the board manufacturers have been securing unbleached sulphite at $43 since the war broke out, which would barely represent the added cost of transportation and insurance. Domestic sulphite mills in the East say that it is a foregone conclusion that prices will be upped $5 at least, possibly $7.50, on first quarter contracts.

The improved position of Scandinavian supply is one of the most encouraging factors at present. The experience of the Danish steamer "Brynhild" is not unusual. Her captain, like several masters of preceding vessels, reported that German pilots had guided them through the Baltic mine fields. The captain of the Swedish motorship, "Gothenburg" reported that he was actually held up only once by a war vessel and then only 20 minutes, for indentification by a British destroyer. Apparently neither belligerent is interfering with the movement of pulp cargo clearly destined for American ports.

New England ports are usually the first reached by incoming vessels with pulp cargoes and they are beginning to arrive in normal time, the chief delay being stormy weather which has beset trans-Atlantic vessels.

In the kraft market there is little pulp available below $38 per ton exdock but certain northeastern consumers have placed orders at $36 to $37, obviously not for the better prime brands. In the case of bleached kraft, one of the best imported varieties costs $63 dock for shipment, which recalls that a leading American brand was withdrawn after successive advances had brought the last price to $65.

Some fortunate northern converting mills are obtaining a minimum volume of Southern kraft pulp by water at prices only a few dollars over the market last summer, and those few dollars represent coastwise vessel freight increases. The f.o.b. mill basis is the same because of ironclad contracts.

Operations of some pulp mills in New England have been on a seven day a week basis. At least four manufacturers are known to be running every day of the week with all equipment that is not down for repair.

◆

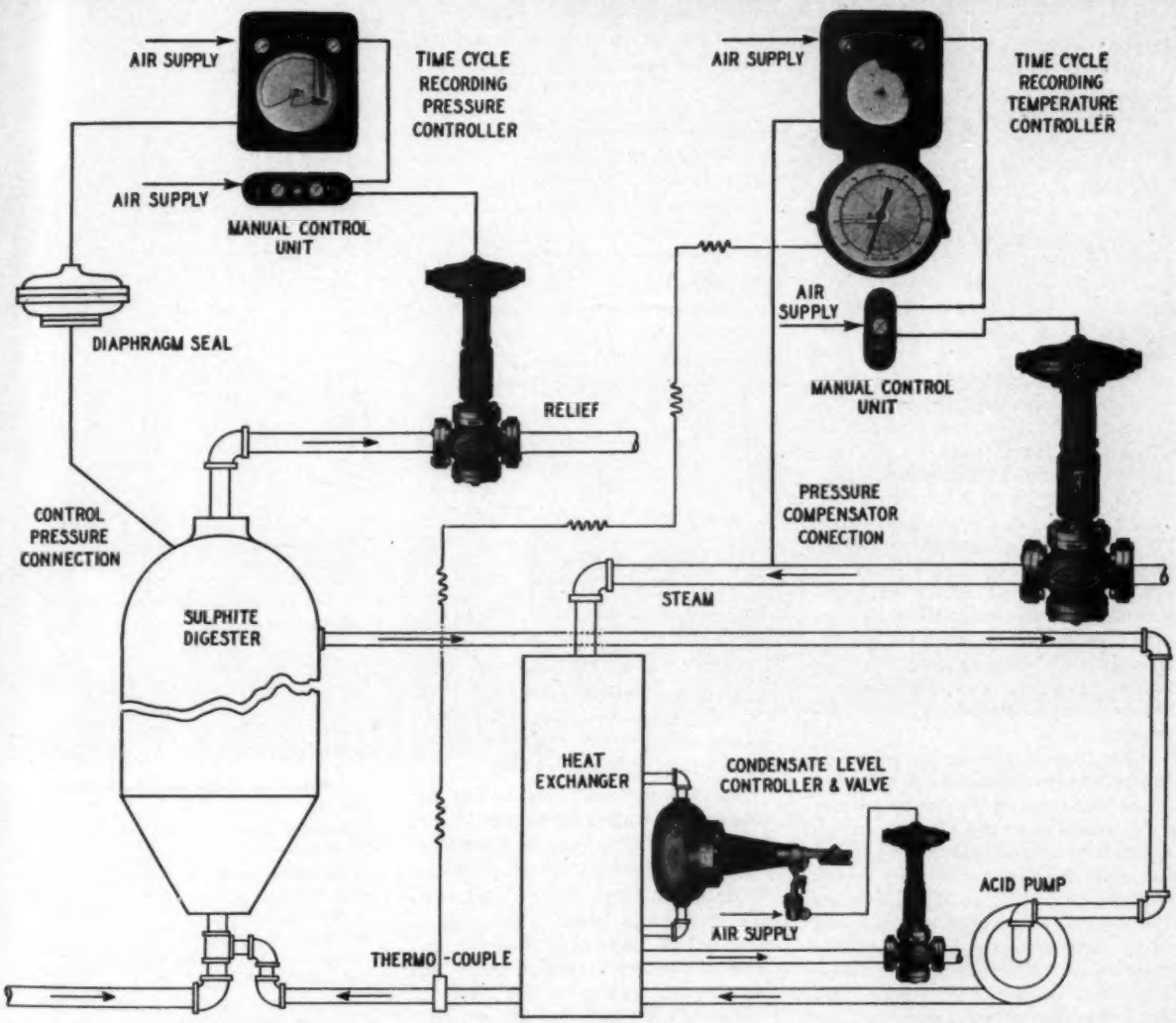
BOOKLET TELLS "PLUS" FACTORS

"Folding Cartons Plus," the newly-published sales promotion booklet of the Container Corporation of America, achieves a new note in modern presentation.

The booklet, designed with the fundamental idea of showing the intangible "plus" factors that go into the fabrication of quality cartons, illustrates in the most modern manner the many factors that go into the making of cartons, including the making of full size specimens by hand; studies of packing problems; choice of color, design and lettering; display needs, etc.

Aside from the very interesting information contained within this new booklet, the publication is a splendid example of what can be done with type and illustrations to present a truly dramatic story of a product. "Folding Cartons Plus" is illustrated throughout in brilliant colors, line drawings, photographs and unusual photomontages.

MASON-NEILAN PRESENTS Controls for Indirect Cooking with Forced Circulation in Sulphite Digesters



AGAIN Mason-Neilan pioneers a control system which enables paper and pulp makers to apply modern controls to modern processing methods. These controls not only include exclusive construction advantages such as the adjustable cam follower, the dual compensated control unit and special control valves, but also provide definite, proved processing advantages. It will pay all users of this cooking method to investigate the economic benefits of Masoneilan Controls. Write for information.

ADVANTAGES:

- Assures constant cooking time and constant pressure schedule.
- Permits predetermined scheduling of digester plant and acid plant operations.
- Simple Cam follower adjustment enables operator to vary temperature end point *at start of cook* according to acid strength.
- Reduces costs by reducing sulphur, lime and steam requirements; by increasing production of higher quality pulp; by minimizing rejects; by increasing acid recovery.
- Produces uniform bleachability with minimum variation in chlorine requirements.
- Maintains exact desired ratio of raw acid to relief gas, assuring uniform acid strength.

MASON-NEILAN REGULATOR COMPANY

1196 ADAMS STREET, BOSTON, MASSACHUSETTS

MASONEILAN

NEW YORK BUFFALO PHILADELPHIA PITTSBURGH CHICAGO TOLEDO ST. LOUIS TULSA HOUSTON LOS ANGELES

FINANCIAL

▸▸▸ SINCE THE FIRST PANICKY RUSH of buyers to stock up with paper and pulp at the opening of the European war, the market has reached a reasonable degree of stabilization, though there have been various price advances of importance. The future of pulp prices depends entirely on the developments of the war situation in the Baltic, particularly Russia's action toward Finland. The present stabilized situation may be radically altered if the war fever directly affects Scandinavia. While there is a wide range of prices for all grades, the following may be taken as ruling prices for various pulps: Kraft $35–$40; bleached sulphite, $55–$60; unbleached sulphite, $38–$45; groundwood, $35–$38. The groundwood pulp had the most spectacular rise, advancing from $20 to as high as $45 before the market leveled off.

The demand for paper is shown by the fact that the mills of the country have operated through the month of October at better than 95 per cent of rated capacity. There has been heavy production to meet demands of customers for paper for stock in warehouse or printing establishments, but there is also an exceedingly heavy export demand. Orders on file will probably maintain production at a high level for months to come, at least. Latin-America is clamoring for American paper, to supplant the shipments formerly received from Scandinavia and Europe.

Some generally accepted price advances have been made. Kraft advanced in the week ending Oct. 28 $5 per ton for standard grades. Coated paper advances have ranged from $6 to $10 per ton and uncoated book paper is not only being advanced in price about $6 per ton, but further advances are likely. Low-grade sulphite bonds have experienced a heavy advance, or rather a series of quarter-cent advances, and the higher grades are also advancing, in some cases $8 per ton.

The effect of the war situation in the coarse paper field is shown in the New York paper bag field. Because of the demand for paper from regular customers, kraft manufacturers have been unable to provide paper for bag manufacturers who had hitherto depended on foreign sources for the paper. As a result, at least two such companies are reported to have been forced to stop manufacture, for a time at least.

The rush to buy paper mill securities which forced prices to a high figure in September was followed by a recession when the neutrality bill was being discussed in Congress, and when, also, peace talks in Europe gave faint promise of an end of the war. With the fading of peace hopes, and the certainty of passage of the Administration cash-and-carry measure, prices slowly worked upward, and the announcement on Oct. 24 of a $5 per ton advance in the price of kraft paper caused a second buying rush which, in many cases, carried stocks to record high prices for the year. The strong tendency of these securities was aided by the reports of consumer demand, which brought the mills of the country to an operating rate of over 99 per cent for the second week of October. Comparative securities prices follow:

A. P. W. Paper Company—Loss for the year ending June 30 was $130,193, compared with a loss of $252,580 for the preceding year.

American Writing Paper Company—Third quarter profits were $67,120, as compared with a loss of $55,160 for the same quarter of 1938.

Central Paper Company—Net income for the year was $121,328, compared with $62,424 for the preceding year.

Champion Paper and Fiber Company—Net income for the sixteen weeks ending August 20 was $320,377.

Container Corporation—Third quarter net profits were $253,060, as against $16,145 for the same quarter of 1938.

Kimberly-Clark Corporation—Profits for the quarter ending September 30 were $460,909, as against $300,090 for the same quarter of 1938.

MacAndrews and Forbes—For the nine months ending September 30, net profits were $599,538, as against $518,546 for the same period of 1938.

Marathon Paper Mills Company—All outstanding bonds, amounting to $1,750,000, have been called for payment at premiums ranging up to 1½ per cent, according to the dates of maturity. New financing at lower rates of interest has been effected, not only to retire the bonds, but to provide funds for expansion of operations.

Masonite Corporation—Net earnings for the year ending August 31 were $1,163,050, compared with $1,144,274 for the preceding year. Of the year's earnings, over $400,000 was for the final quarter of the fiscal year.

Sutherland Paper Company—Profits for the quarter ending September 30 were $271,174, as against $114,985 for the same quarter of 1938.

Union Bag and Paper Company—Earnings in August were $85,000, a greater profit than was earned during the entire second quarter of this year.

New York Stock Exchange—Stocks

	Closing Prices Oct. 25	Sept. 25
A. P. W. Paper	3	3⅜
Celotex	11½	10¾
Same Preferred	62	*66–68
Certain-Teed	8⅛	7½
Same Preferred	36¾	30⅜
Champion P. & F. Co.	28¼	20⅛
Same Preferred	*100¼–101	*100–102
Container Corp.	16⅜	15½
Cont. Diamond	8½	8⅜
Crown Zellerbach	16¼	15⅜
Same Preferred	88½	90
Dixie Vortex	12¼	11
Same "A"	*32¼–32½	32
Flintkote	22⅞	18
Robert Gair	5½	5¼
Same Preferred	18⅜	15⅜
Gaylord Container	15	14¾
Same Preferred	*47¼–50	*41–43
Internat'l P.&P. Co.	14¼	13¾
Same Preferred	51½	47¾
Kimberly-Clark	36¾	35½
MacAndrews&Forbes	*30–30½	*33–36
Masonite	41¾	35½
Mead Corp.	13	13¾
Same Preferred	72	56
Paraffine Co.	46	*41–43
Rayonier	17¾	15⅞
Same Preferred	26	23
Scott Paper	50	46¾
Same Preferred	114	113
Sutherland Paper	27½	26
Union Bag & Paper	12½	12½
U. S. Gypsum	84¾	72½
Same Preferred	165	*175–176

New York Stock Exchange—Bonds

Celotex 4½%	85	76
Certain-Teed 5½%	75⅞	74⅞
Champ. P.&F. 4¾%	.....	102
Container Corp. 5%	95½	100
Int. P. & P.Co. 5%	99¼	99
Same 6%	92¼	91
Mead Corp. 6%	.....	102

New York Curb Exchange—Stocks

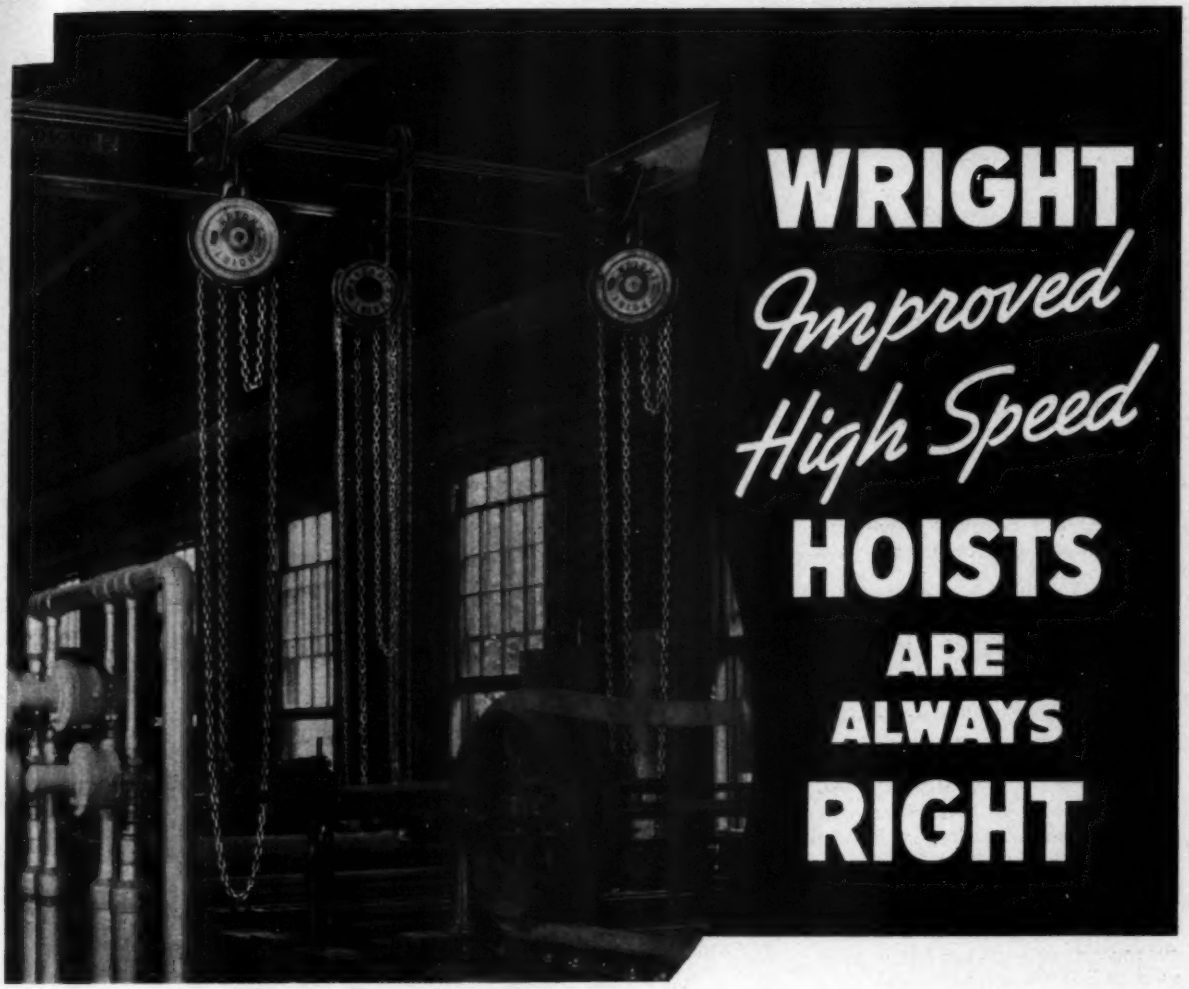
Am. Box Board	7½	9
Brown Co. Pfd.	25½	22
Det. Pap. Prod.	*1⅛–1⅞	1⅞
Great Northern	41¾	43¼
Hummel Ross	5⅜	5½
Nat. Container	9	10¼
St. Regis	3¾	4
Taggart	4¾	4¾
United Wall Paper	2	2¼

*Closing Bid and Asked.

◆

GR. NORTHERN CO. HOST TO ENGRS.

The Maine Association of Engineers were guests recently of the Great Northern Paper Company for an inspection tour of the latter's new power plant at Mattaceunk, Maine. Members of the Association met at Lincoln, Maine, where they were welcomed by F. C. Bowler of the Great Northern Paper Company. Professor Charles M. Allen of Worcester Polytechnic Institute delivered a paper on "Water" in which he discussed his velocity method of measuring flow.



★ The Wright Hoist is always right because it always handles the hoisting jobs with speed and economy.

Precision load wheel bearings provide fast, smooth, positive action. There is a load chain safety guard that makes it impossible for the load chain, regardless of its position, to ride out of the pocket. There is no corrosion to fear. Zinc-coating prevents it.

These are only three of the 21 features that make the Wright Improved High Speed Hoist the hoist for fast, convenient, low-cost operation in countless applications.

Wright Hoists, Trolleys and Cranes, in capacities from ¼ to 40 tons, are described in the new Wright Catalog. Write for your copy.

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BUY ACCO QUALITY *in Wright Hoists, Cranes and Trolleys; Tru-Lay Preformed Wire Rope; Reading-Pratt & Cady Valves; Campbell Abrasive Cutting Machines; American Chains; Page Welding Electrodes and Page Wire Fence.*

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SURVEY COMPLETED ON FOX RIVER POLLUTION

▶▶▶ WASTE FROM WISCONSIN'S Fox River Valley paper mills between Appleton and thirty miles downstream to the mouth at Green Bay, is the cause of more than 90 per cent of the pollution in Fox River and the bay into which it empties.

Such is the finding of a pollution survey started just a year ago and recently completed at a cost of nearly $10,000, according to a report made public at Green Bay by the Wisconsin State Board of Health Committee on water pollution in collaboration with the Green Bay Metropolitan Sewerage Commission. The results were announced and discussed recently by Adolph Kanneberg, committee chairman; Dr. C. A. Harper, state health officer, and L. F. Warrick, state sanitary engineer.

The report stated that even if sewage disposal plants throughout the valley were 100 per cent efficient, and, the report stated, they are not; they would still remove only 7 per cent of the pollution load of Fox River. Each city throughout the valley has a sewage disposal plant or is in the process of building one but the efficiency runs from 30 to 60 per cent, it is claimed. Five per cent of the pollution is attributable to white water waste from the mills and miscellaneous sources, while 88 per cent is waste sulphite liquor, the report stated.

The survey also revealed that while white water can be treated with present disposal facilities, sulphite liquor cannot as yet, although experiments to this end are in progress. The so-called "Howard process" for treating sulphite waste by precipitation fails to settle out the carbohydrates or wood sugars, which deplete a stream's oxygen content and provide food for the odor-producing bacteria, it declared.

Large banks of sludge deposited along the bottom of East River over a period of years were found to be paper fibers and sewage waste, but these banks do not of themselves give off an odor, the report continued. Such deposits do, however, harbor bacteria which will do so in the presence of sugars found in liquor and the gas, produced by decomposition of sulphur compounds in the sulphite liquor, is hydrogen sulphide which has an odor akin to bad eggs.

The survey found that fish died in Green Bay from suffocation because of depleted oxygen in the water, but added that they were not scalded or bleached by sulphite liquor. Laboratory tests were made with concentrations of sulphite liquor much stronger than any found in the bay and no bleaching was apparent.

Results of the oxygen-robbing qualities of sulphite waste were confirmed by extensive laboratory tests in which bottom river samples from various localities, subjected to different temperatures and incubation periods, gave off hydrogen sulphide only in the presence of sugars, wood or otherwise, the report asserted.

In conclusion, the report pointed out that no relief could be expected from the conditions observed in Green Bay until equipment which would remove at least the major portion of the oxygen-consuming material in waste sulphite liquor, is installed at all mills discharging this liquor into the lower Fox River.

◆

WAR TRADE

Further news relating to the restrictions made by various nations on their imports and exports has been released lately by the United States Department of Commerce. This news is supplementary to that which appeared in the October issue of THE PAPER INDUSTRY AND PAPER WORLD.

Australia

Certain increases in Australia's import duties were announced recently. These increases apply on gasoline, benzol, turpentine substitutes, certain types of crude petroleum, lubricating oils and liquors. In addition to these increased duties, certain other products, formerly admitted under by-law either free of duty or dutiable at 15 per cent ad valorum under the general tariff, are now dutiable at 20 per cent ad valorum. These latter articles include fiber board, leather board, tissue paper for interleaving and wrapping purposes, in addition to waxes, steel mattress wire, steel wire for pneumatic tires, toothbrush handles and satin and veneers.

Lithuania

The Lithuanian Government has subjected all imports and exports to permit control and has provided preferential treatment for imports of essential products. Preferential treatment is to be given to imports of cellulose, wools and yarns, metals, coals, rubber, glass and other products.

Finland

Every attempt will be made to continue exports of paper and pulp to the United States, according to word received from Finland. The main obstacle seems to be transportation, which, it is believed, can be regulated in due course. If the Scantic line continues Finnish service, the entire traffic probably will be via the Baltic, otherwise some shipments will go through the Finnish arctic ports.

Belgium

The importation into Belgium of straw cardboard and gray cardboard has been made subject to import permit requirements by Royal Decree. The exportation of rags, waste paper and old rope has been made subject to export permit requirements.

Bohemia-Moravia

The importation of foreign newspapers and periodicals and into Bohemia-Moravia has been restricted. It is stated that scientific and fashion journals are excepted under the provisions of the decree.

Argentina

The Argentina Exchange Control Office has authorized the granting of a preferential exchange rate for many products important to American trade. Included among these products are paper (wrapping, writing and book), wall board, pasteboard, and newsprint.

Denmark

The Danish Government has again made the importation of dried fruits, coffee, leaf tobacco and newsprint subject to import permit (exchange certificate).

France

A French decree provides that owners (or their representatives) of merchandise aboard vessels visited in French waters may be required to sign a guarantee assuring that the merchandise will be delivered in a neutral country and that it will not be re-exported, directly or indirectly, to any enemy country or a country occupied by an enemy.

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▶▶▶ THE PRICE OF NEWSPRINT in the United Kingdom is now £17 (about $68) per ton, an increase of 46.6 per cent since the European war started, according to a press report. The principal reason for the increase, it was stated, is the difficulty in obtaining pulp from Norway, Sweden, and Finland.

OPACITY · WHITENESS · BRIGHTNESS

Why talk about LEATHER *to* PAPER *manufacturers?*

... For this reason: If paper makers knew as much about TITANOX pigments as leather tanners do, all paper stocks would be made opaque, white and bright with these modern efficient pigments.

Leather manufacturers use TITANOX pigmented finishes in the processing of white leather because they promote the maximum obtainable of opacity, whiteness, brightness and flexibility. Experience has taught that leather, once whitened with TITANOX pigments, remains white without after-yellowing. To cover and hide skins that are especially hard to finish is no problem when TITANOX pigments are used.

In paper making these titanium-derived pigments produce the same desirable results whether employed as beater additions or surface coatings. They make possible unique sheets never produced before, low in ash content and great in strength, with show-through largely eliminated even in light-weight stocks.

Use TITANOX pigments with confidence, in all grades of paper stocks. Our Service Department will gladly advise regarding their application.

What's in a name?

TITANOX represents the products of the original makers of titanium pigments who have pioneered fundamental improvements which have brought these pigments from unknown materials to essential commodities in the paper industry. In their present form TITANOX pigments exhibit the ultimate of scientific skill and manufacturing technique in the development of titanium up to this time. Therefore TITANOX means not only excellent pigments, but also a notable record of accomplishment in making them faithful to your needs.

You need TITANOX in your coated stocks to produce brilliant whiteness.

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TITANOX

REG. U.S. PAT. OFF.

CONTAINER CORP. TO IMPROVE PLANTS

The Container Corporation of America will expend $250,000 for power plant improvements at the company's Chicago plant, it was announced recently at a meeting of the board of directors. The company will also install oil burners and a service tank at the Philadelphia plant and water supply improvements at the Circleville (Ohio) strawboard mill.

J. V. Spachner

At the meeting of the board it was announced that J. V. Spachner, president of the Pioneer Paper Stock Company, a Container Corporation subsidiary, had been elected vice president.

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NEW ENGLAND FREIGHT RATES

THE INTERSTATE COMMERCE Commission has decided to let the Boston & Maine and the Boston & Albany Railroads experiment with their proposed new reduced carload and less carload rates from New England paper mills to Boston. The carriers want to win back a little of the traffic moving by truck.

PAPERMAKERS in northern New England were interested in a series of freight reductions on bituminous coal applying ex-water from Searsport, Bucksport and Bangor, Maine, to destinations on the Canadian Pacific, Aroostook Valley, Bangor and Aroostook and to a very few points on the Maine Central. Reductions apply to some, not all, points and are around 8 to 9 cents per ton. Reductions in extreme high mileage brackets indicates that some of this coal is planned for trans-shipment to Canadian consumers.

THE FREIGHT RATE on binder board and chip board from Montville, Connecticut, to New York City, is to be advanced from 14 cents to 19 cents.

A SWITCHING CHARGE of $6.93 per car at Holyoke, Massachusetts, is proposed by the Boston & Maine Railroad to apply between plants of the AWP Corporation in place of the present rate of 2¾ cents per 100 pounds. The reduced rate would be effective only when the B. & M. receives a line haul on the cars.

◆

WASHINGTON

▸▸▸ BECAUSE OF THE European situation the United States Tariff Commission has notified the United States Senate that is is discontinuing the investigation of pulp manufacturing conditions here and abroad and will not make the report called for on April 15 unless further instructed by the Senate.

▸▸▸ THE FOREST INDUSTRIES Conference, formed to co-ordinate the activities of industrial groups affected by forestry problems with the work of federal and state forestry agencies, has begun to function, the first actual meeting of the conference having been held with Secretary Wallace of the Department of Agriculture. Acting as a clearing house for information and discussion of policies, the conference will hold monthly meetings. The paper industry is represented by Charles W. Boyce of the American Paper & Pulp Association and H. M. Brinkerhoff of the American Pulpwood Association.

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LOUD CALL FOR WOODSMEN IN NEW ENGLAND

A heavy call for woodsmen has been sent out in Coos County, in the northern tip of New Hampshire, and in central Maine, as pulp and lumber companies plan one of their most extensive cuts in years. The pulp manufacturers will begin at once, as soon as sufficient men are recruited, although most of them only finished peeling the 1938 cut about two months earlier. The present year is one of the very few on record when crews will be maintained in woods operations throughout the 12 months of the year.

MARATHON PLANS NEW MENASHA OFFICE BUILDING

A new three story office building has been added to the previously announced $100,000 addition to the Marathon Paper Mills at Menasha, Wisconsin.

The office addition will be constructed of brick and concrete and will be located along the east side of the new construction on the river bank. Construction work is progressing rapidly on the other addition.

◆

EASTERN CORP. ECONOMIZES

Moves of the Eastern Corporation management since its emergence from 77-B reorganization indicate substantial savings in operating costs, according to a report from Maine.

The company is soon getting under way with a new type chlorine-treating plant which will be a cost-reducer; the intermill operations have been motorized which effects savings over rail operation; the wharf property has been improved to permit receipt of larger vessels and economies throughout the sales department have been put through. One estimate places the savings of these and other moves as high as $300,000 annually. The company is currently operating at capacity in both its pulp and paper divisions and at both its Brewer and Lincoln mills.

BRIEFS

▸▸▸ ARTICLES OF INCORPORATION have been filed for the Falls Paper and Power Company, Oconto Falls, Wisconsin, which will manufacture and sell pulp, paper, and paper products. Incorporators are Mrs. Janet Ewing, Dr. George E. Forkin, Margaret Taylor Forkin, and Charlotte Smith. The company has 1,000 shares of no par value.

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▸▸▸ A NEW CORPORATION, Outagamie Mills, Inc., will occupy the old Patten mill building at Kaukauna, Wisconsin. Articles of incorporation were filed recently by Daniel E. McCarty of Kaukauna, and Andrew J. Johnson and Milford J. Taylor, of Appleton. The new company will manufacture and sell pulp paper and paper products.

▶▶▶ PLANS ARE UNDER WAY for the construction of and equipment for an additional evaporator house at a cost of about $90,000 at the Savannah (Georgia) plant of the Union Bag and Paper Corporation, it was reported recently. It was stated that the structure is to be three stories high with asbestos siding on steel work.

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▶▶▶ THE MILLS AND BUSINESS of the McDowell Paper Mills, Manayunk, Philadelphia, Pennsylvania, has been acquired by the Glassine Paper Company of West Conshohocken, Pennsylvania, and the former units will hereafter operate as the McDowell Paper Mills Branch of the Glassine Paper Company.

◆

▶▶▶ THE GREAT NORTHERN PAPER COMPANY is one of the leading units of the paper industry that has planned to overcome added costs from the 42-hour week under the wage-hours laws, by employment of additional crews. When hours were originally cut under the law from 48 to 46, the company trained new crews for various departments who filled in the gap which must otherwise have meant overtime pay. Extra crews will do the same thing for them under the 42-hour week.

◆

▶▶▶ THE MARVELLUM COMPANY of Holyoke, Massachusetts, manufacturers of coated papers for the box industry, is one of 41 manufacturers in Massachusetts to receive an award of a "certificate of merit" from the Associated Industries of Massachusetts. The awards are made for new or improved products developed.

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▶▶▶ A NEW ORGANIZATION to be known as Pulp Recovery, Ltd., has been established in Hawkesbury, Ontario, and will commence operations removing waste pulpwood from the Ottawa River for the purpose of manufacturing heavy paper boxes and other paper products.

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▶▶▶ THE SCUTAN DIVISION of the Union Bag and Paper Corporation has been moved from New York City to Hudson Falls, New York, in order to provide closer co-ordination of management, sales and production activities.

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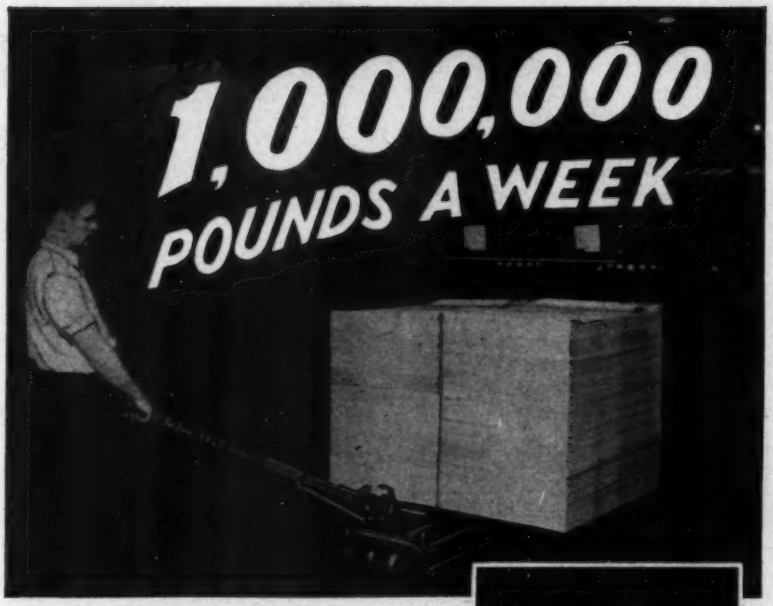
▶▶▶ A NEW ONE-STORY ADDITION will be erected to the mill of National Cellulose of Canada, Ltd., Toronto, manufacturers of special tissue and other paper stocks.



HANDLED BY
YALE HAND LIFT TRUCKS

Taking into consideration the various movings, there are over 1,000,000 lbs. of quality paper being handled every week at the Dalton, Massachusetts, plant of the Byron Weston Company, leaders in ledger paper. This is a real handling problem that brooks no inefficiency. The slightest laxity, and production would be slowed up all along the line—resulting in higher costs at the expense of profits.

So naturally Byron Weston use the most efficient system of materials handling that they could possibly find—a fleet of Yale Blue Streaks working in conjunction with Yale Skid Platforms. These trucks and platforms are in constant service under capacity loads—yet never have they given any trouble. A typical Yale record!

And here's what the Byron Weston Company have to say about their equipment:

"On the job every day in the year, our Yale and Towne Blue Streaks have proven their safety and efficiency to our entire satisfaction. But above all, one thing stands out—THEIR AMAZING ECONOMY."

"But above all, one thing stands out—THEIR AMAZING ECONOMY." That's a statement which reflects Yale service to a "T." Easier to operate—Cheaper to maintain . . Yale Hand Lift Trucks have proven by actual on-the-job service their uncanny ability to cut handling costs to the very bone. No wonder plants which use them are so enthusiastic!

Make the predominant choice of modern industry your choice. Switch to Yale—and SAVE!

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THE FAMOUS YALE BLUE STREAK—Single Stroke Hand Lift Trucks, 2,500 Lbs. Capacity.
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WIDE FRAME MODEL
YALE MARKED IS YALE MADE

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THE YALE & TOWNE MFG. CO.
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Fig. 2129
Single Wedge Disc
Non-rising Stem

Fig. 2125
Double Wedge Disc
Rising Stem

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BRONZE GATE VALVES

These two valves offer more economical and satisfactory service on the numerous low-pressure applications around industrial plants.

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On your next order for 125 lb. S.P. bronze gate valves, specify Fig. 2125 for the Double Wedge Disc, Rising Stem type or Fig. 2129 for the Single Wedge Disc, Non-rising Stem type. You will profit from the excellent service you will get from these fine valves.

For detailed design and construction features write for circular 544.

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Editorial

★ ★ ★

WHAT IS GOING TO HAPPEN?

▸▸▸ WE DON'T KNOW what is going to happen nor do we know of anyone who does. Yet, everyone is asking this question of his neighbor "What's going to happen?" The reason for the question is the conduct of the European War. It is not running according to form, or according to the preconceived notions as to how a war should run, and therefore, no one can chart his business course until he can see the respective strength of the combatants and get an idea of which is liable to win and when.

It is now more than sixty days since war was declared and as yet the combatants have not had any combats on any war-like scale. Now, with winter settling down on the western front and the Germans still on German soil and the French still sticking closely to their lines in France, the prediction is widely made that there will be no war-like campaign inaugurated by either side until next spring. "What kind of a war is this anyway?" says the man on the street. "Is it a war of conquest, a war of accommodation, or will it turn out to be just 'a machine gun petting party?' "

All we know is that war was declared on Germany by England and France on September 3. A declaration of war always has been followed immediately by antagonists shooting up each other's armies and destroying each other's property on a huge scale. But no such war-like activity has ensued for the past sixty days.

Believing that the declaration meant immediate action on some such scale as that pursued by Germany in the last war, the countries of the world immediately leaped to precautionary preparations for the titanic struggle which they believed was so imminent. But, no struggle has eventuated. Why? Frankly, we don't know, neither have we been able to find the answer. Men and women by the millions and wealth and supplies by the billions have been mobilized and still are being mobilized on account of that declaration of war. And as long as that declaration of war stands, something eventually will have to be done about it.

In the meantime, what are we to do in this industry of ours whose operations have been so drastically quickened? Two outstanding facts appear now upon which we can predicate our actions: the first is the duration of the war; the second is the price of woodpulp. Within twenty-four hours after England declared war on Germany, she clamped down an almost water-tight blockade of the Baltic and North Seas. And until this declaration of war is dissolved by the triumph of one or the other of the warring nations, or by the mutual agreement of all combatants to conclude peace, the blockade will remain and the demand for paper products will doubtless exceed the supply because:

The United States production of paper products is vitally dependent upon a regular and uninterrupted flow of wood pulp from the Baltic States. A stoppage of 10 per cent of pulp supplies from that source means a shortage of products in this country, but a curtailment of 30 to 40 per cent, as it now appears is evident, means a drastic shortage of paper products in America. Hence, there are only two factors to watch, the duration of the so-called war and the price of wood pulp. They will tell you what is going to happen in the paper industry. As to the duration of the war; the character of the warfare; or whether there is to be any war on any previously known basis; these are questions beyond our ken. The uncertainties of the present situation are puzzling beyond solution.

GRAPHS OR FIGURES— DOES IT MATTER?

▸▸▸ A HUMOROUS PUBLICATION distributed by the National Safety Council at the Congress in Atlantic City, displayed a cartoon which, although very comical, presented an ambiguity that carried a real lesson. The background of this illustration was a sheet of squares such as are ruled on graph paper. A hurried business man stands in front of this large sheet pointing an accusing finger at the bedraggled artist who had just finished his assignment, and waves the other hand toward the figure of an immense giraffe. The caption reads "No, no, you fool! I said 'graph'."

Graphs, of course, are a diagrammatic and visual presentation of statistics. And although some will assert "there are more accidents every day," the best way to meet that statement is to use figures, for mathematics is, of course, the science of order.

At one session of the Paper and Pulp Section of the National Safety Council, figures were presented in a report of Data on the Contest Among Paper and Pulp Mills, which proved very definitely that progress has been made in reducing accidents in the mills. Reviewing the figures for the past eight full-year contests, the report showed the number of disabling injuries per million man-hours worked was the lowest of any previous period and 18 per cent lower than the average rate for the preceding seven years.

Among the mills in one group that participated in this contest, nine had perfect scores. Contests, then, do not urge competition just for the sake of winning, but through participation, men in hazardous work gain valuable knowledge of accident prevention. Thus in industry, on the highway and at home, the lessons learned through contests strengthen the cause of safety, and when added up, the figures prove contests *do* show results.

CURRENT THOUGHT

RANDOM THOUGHTS

WILLIAM SIBLEY

▶▶▶ LAST NIGHT I listened to a radio broadcast from Paris, the entire portion of which was devoted to talking about the current war. The broadcast interested me, not so much from the information and news that was imparted, (because very manifestly the words of the commentator had been pre-controlled by a severe censorship) as for the memories of another war in which I was one/two-millionth of the American participation and of the memories of Paris which seems always to pop into my mind when I think of my experience in France.

One evening in late January (following the November armistice), three of us were strolling down the Champs Elysee. In the night sky the giant Eiffel Tower stood silhouetted dark and majestic. Presently we noticed two American army officers engaged in a verbal battle with a Parisian gendarme. Master Engineer Meyers, who knew French better than the other two of us suggested that we walk over to the officers, determine the cause of the altercation, and see if we couldn't be of some assistance. Our presence was hailed with delight by the officers, who gave every staggering evidence of being very much under the influence of cognac. One captain virtually ordered us to do the impossible: "get this crazy French cop away from here". Meyer wanted to know why! What had *he* done to offend them, or, more to the point—what had *they* done to gain the attention of the gendarme?

"Aw, for the love of Madelon" replied the Lieutenant—"just because the captain here and I have a hammer and monkey-wrench—this cop wants us to either come with him to the station house—or throw away these tools". That was the first time I had noticed that the officers were carrying heavy workman's tools—a wrench of sizeable grip, and a smithing hammer. In their present state of inebriety, of course, the gendarme would think the officers bent on malicious mischief and would want either to take them into custody or disarm them. I inquired of the officers the meaning of the tools. "What are you going to do with them?" I asked. Whereupon the captain, who was a bit more under the weather than the lieutenant, replied: "Ya shee that there Eiffel Tower over there? Well shir, the lieutenant and I are going over there and take the whole darned thing down—nut by nut and bolt by bolt". Obviously this brought laughter from the five Americans, and under the break of the laughter we got their tools away from them and repaired to another cognac shop.

Had the two drunken army officers really undertaken to complete their intended foolishness they might have found that Gustave Eiffel had proved himself a good builder. The Eiffel tower is a victory for progressive design and was one of the architectural triumphs which did much to hasten the day for steel-skeleton buildings. Although the immense structure is worked entirely in wrought iron, M. Eiffel's detailing of structural members would be entirely adequate and adaptable to modern riveted steel construction. The tower was started early in 1887 and while Gustave Eiffel executed the foundations in stone masonry, he did so in such a modern, far-sighted way as to anticipate modern reinforced concrete design. The Eiffel Tower stands today a monument to a designing architect and engineer who was so far ahead of his time as to have his methods vindicated only after both he and his contemporaries had long been in their graves. Indeed, did you know that it was Gustave Eiffel who implemented the grandiose scheme for Bartholdi's Statue of Liberty, and that it was he who designed the interior steel framework for that Statue? Yes, taking the Eiffel Tower down "nut by nut and bolt by bolt" (with a smithing hammer and a monkey-wrench) would be quite a job.

▶▶▶ IN THE NOVEMBER ISSUE of *Fortune* there is an article entitled "The History of the War." It is prefaced by an article by Mr. Buell titled "Communication—the Fourth Front". Both are exceptionally well written and well worth reading. There has been such a dearth of accurate or reliable information regarding the movements of either governments or armies that there is little point to reading our newspapers or listening to our radios. There is a reason (several of them) for that—and they are outlined in detail in Mr. Buell's article. Following that piece (which is comparatively short) is a staff written article "The History of The War"—and it outlines, analyses and parses the events from early 1914 to September 3rd, 1939, in a way that shows you exactly what might have been done—what wasn't done—what was done that was both wrong and right—on the part of *all* countries affected. If you can't find a copy for sale (November issue of *Fortune*), or if you haven't a dollar (speaking in the first person singular) borrow a copy from some friend who is a subscriber. It is an article that everyone should read, not only from his understanding of the war at the present time but from what might become the turn of events in the near future. The writer pretend to be no prophets, and certainly they are pro-nothing or anti-nothing. They merely orient your mind regarding events which have led the world into this war. It is well worth reading.

ADVERTISING PAGES REMOVED

Electrical Equipment Maintenance *in Paper Mills*

CLYDE A. FARRELL
Maintenance Superintendent
The Mead Corporation, Chillicothe, Ohio

WHILE the fundamentals of electrical maintenance hold good in any industry, some conditions peculiar to paper and pulp mills introduce problems that require changes in the ordinary routine regarded as economical and justified in other kinds of plants.

Paper mill service requires the continuous operation of electrical equipment twenty-four hours a day and six days a week. A motor which has operated for ten years in a paper mill would have given the equivalent of twenty to twenty-four years' service elsewhere in industry. Moreover, it will have had to withstand much greater wear and tear than in the average application. Especially will this be true so far as deterioration due to consistently high temperatures is concerned.

Most electrical equipment, and especially motors, are designed to carry their full rated load with only a 40 deg. C. rise. However, this means very little unless the ambient temperature is taken into consideration. Let us say, for example, that a motor is installed in a room with an ambient temperature of 40 deg. C. Fully loaded, the temperature of the motor then will probably be 40 deg. plus 40 deg. or 80 deg. C. This is a reasonable temperature and not injurious to the motor insulation.

Suppose, however, the same motor is installed in a location having an initial temperature of 50 deg. C. Fully loaded, this motor will run up to 90 deg. C., at which point a slow but progressive deterioration of its insulation is bound to start. And it would not take much of a sustained overload on the motor to materially hasten the breakdown.

The atmosphere in paper and pulp mills is unavoidably moist and humid. There is a profusion of water everywhere —tanks and chests to overflow, piping to leak, condensation to drip, and tanks and supply lines to empty some part of their contents on the floor when taken apart for cleaning or changing about. Pump motors must frequently be located in pits below the floor level where they may be flooded upon occasion. In pulp mills, particularly, steam and fumes are prevalent, and all cleaning of floors and equipment is done with the ever-present hose and water.

Dirt and foreign materials, sucked into motor windings by the motor shaft ventilating fans, constitute another important enemy of such electrical equipment in paper and pulp mills. The list includes abrasives such as lime, clay, soda ash, coal dust and other chemicals such as alum, rosin and dyes. Some of these materials attack the motor insulation; others clog the air ducts intended to keep the motor temperature down; still more sift into the oil wells, contaminating the lubricants and scouring the bearings.

Still another major paper mill hazard is to be found in the presence of such destructive chemicals as acids, chlorine, and strong alkaline liquors. These chemicals not only actively attack insulation, but copper as well, and slight additions of any of them to water or air-borne moisture will make the latter highly conductive and, therefore, doubly treacherous around electrical equipment.

Finally, paper mills generally operate at higher voltages—either 550 or 2300 volts—rather than the more universal 220 or 440 volts used in other plants. And, of course, the higher the operating voltage of a system, the more vulnerable it becomes to breakdowns from any of the conditions which have just been enumerated.

Two Kinds of Maintenance

By and large, the maintenance of electrical equipment can be divided into two parts. The first might be called the *necessary maintenance,* and consists of so many men, tools, and other equipment required for making repairs in the event of breakdowns in electrical motors, controls, or circuits. The second is the so-called *preventive maintenance*—designed to anticipate, or at least to minimize, electrical equipment failures, both as to frequency and severity. A really good maintenance system is a judicious combination of the two programs.

Preventive Maintenance

Preventive maintenance starts with the specification and purchase of motors, controls, and other electrical equipment. Because of the conditions already outlined, paper mill service calls for the highest grade equipment—with special engineering attention given to the application of each piece of equipment to insure that it meets the requirements of the job and is at the same time well adapted to surrounding conditions. Careful thought must be given to motor torque, to operating speeds, to load cycles, and to the type of motor best suited to the particular assignment.

Many drives will require standard squirrel-cage induction motors, but there are other drives in a paper mill, such as beaters, refiners, chippers, and hogs, which have heavy inertia loads that often need high torque motors. A policy of deliberately "over-motoring" many such jobs has been found to pay handsome dividends in reduced maintenance later on. Likewise, paper and pulp mills have hundreds of pump drives, some of which are simple direct-connected units, but many more of which are more complicated applications that may transmit axial thrust loads to their motors, causing bearing failures. This trouble, however, can be eliminated by using properly designed flexible couplings.

Mill No. 8IR

MOTORS

Make Reliance Makers No. AIE797

Type Fan Cooled Frame IR04L Bush Size

Phase 3 Volts 550 Amperes 13.6

H. P. 15 R. P. M. 875

Pulley Diam. Direct Drive Face Bore

Bearings Type No.

Installation No. 7 Stock Chest Agitator Drive Date I/7/30

Repairs	Date	Cost
I Set of bearings on hand		

Motor record card.

MOTORS

Mill No. 7429

Make Reliance Makers No. 247768

Type T - Frame 65I-T R. P. M. 300 - 1200

Phase Direct Current H. P. 30 - 50

Insul. #10 Machine Winder Date 5/18/22 Insul. Date

Insul. Date Insul. Date

DATE	TIME LOST	MATERIALS USED	MEN. LABOR	LABOR COST	TOTAL COST
5/I/28	None	I - Set of brushes $9.60	I Hr.	$.80	$10.40
TOTAL					

Cost of motor repairs kept on this card.

LOAD SURVEY RECORD

Motor No. 7283 Make Reliance Hp. 20 Rpm. 860 Ph. 3

Volts A. C. or D. C. Type Sec. No. AIY256

Type Drive Direct Drive Installation Agitator Spd., Washed Stock Chest

Transferred From Second Floor Digester Room Temp. Rise

Date	Ave. Hp.	Max. Hp.	Min. Hp.	Ave. K. W.	Ratio	Temp.	Temp. Rise	Amp. Temp.	Notes
5/5/25	11.4	18	11	9	83:5	76	83	87	Fan Cooled Motor

Card on which results of periodic load surveys are recorded.

MOTOR INSPECTION

Motor r/o

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Oil Changed in Bearings

Motor Gauged

Starter Contacts Cleaned

Motor Oil Changed

Brushes Ground

Commutator Cleaned

Repairs Made

Condition of motor recorded on this motor inspection card.

HEAD CORPORATION INSURANCE DEPARTMENT

TEST RECORD OF INSULATION RESISTANCE

PLANT

APPARATUS No. 1 Turbo-Generator 3500 K.W.-4375 K.V.A. Turbine Room No. 3 Mill.

DATE INSTALLED 4 - 26 - 30 M. I. Eng. No. K - 910

Date	1937 1st half	1937 2nd half	1938 1st half	1938 2nd half	1939 1st half	1939 2nd half

MEGOHMS: Infinity, 100, 50, 30, 20, 15, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.0

OHMS: 1 Megohm, 900,000, 800,000, 700,000, 600,000, 500,000, 400,000, 300,000, 200,000, 100,000, 90,000, 80,000, 70,000, 60,000, 50,000, 40,000, 30,000, 20,000, 10,000, 1250

Stator ———— Field - - - - -

Insulation resistance values charted on this form for turbo-generator equipment.

CONTROLLERS

Date	Operation	Men

MOTORS

Date	Gauged	Men

Date	Bearings Greased

This card combines condition reports on both controllers and motors.

THE HEAD CORPORATION - CHILLICOTHE DIVISION

DAILY TRUCK BATTERY RECORD

Date ____ 19__

TRUCK	SPECIFIC GRAVITY CHARGED	SPECIFIC GRAVITY DISCHARGED	WATER ADDED	CHARGING RATE AMPS	VOLTAGE VOLTS	VOLTAGE TO	OPERATOR
Lakewood							
Yale							
Boeing							
H. Ice							
Crane No. 1							
Crane No. 2							
Automatic Skid							
Auto. Lift No. 1							
Auto. Lift No. 2							

Remarks

Daily record kept on condition of plant truck batteries.

Left—Stock pumps driven by 75 hp. splash-proof squirrel-cage motors. Right—Auxiliary d-c. gearmotor drives on wet-end rolls of cylinder board machine.

Sometimes pumps are required to start and stop many times an hour. Take, for example, a stock pump, delivering pulp to a tank or chest under float control. Where such motors are required to start more than six times an hour, the high starting current may build up excessive temperatures although the motor is not actually overloaded during operation. This type of service should have a motor slightly larger than is indicated by a consideration of the load alone. The motor temperature, taken at the time of most severe service, should be the guide in determining the extent to which "over-motoring" should be applied.

Splash-proof motors are a boon to paper mills and should be applied to all drives subject to drip or overflow from above or splash from hose cleaning methods. Again, many motors must run exposed to dust-laden air. Enclosed fan-cooled motors are ideal for these drives since the outside air does not come in contact with the motor windings and they can be kept clean although operating in the presence of coal dust, lime, clay, etc. It should be remembered, however, that these motors are rated for 55 deg. C. temperature rise, rather than 40 deg. C., and care should be taken to install units large enough to operate within this temperature range. In some cases, especially in pulp mill locations, it may be necessary to furnish totally enclosed, ventilated motors.

Synchronous motors should be furnished for motor generator sets, jordans and pulp grinders to maintain a satisfactory power factor in the plant. Where even more synchronous motor capacity is needed to obtain a satisfactory power factor, there are many other drives which lend themselves to this type of motor, such as large pumps and beaters. However, such synchronous motors should be carefully engineered to insure a good torque for the job. By maintaining a high power factor in the plant, many troubles can be avoided, such as overloaded generating equipment and circuits, poor voltage regulation, etc.

In the application of slip ring motors of the variable speed type careful consideration should be given to load requirements. This type of motor must be kept well loaded to obtain the full speed reduction expected.

In the application of direct current motors it should be remembered there are shunt, series and compound wound motors, each having characteristics suited for specific drives. In addition, special care should be used in the selection of d-c. control to see that it fits the drive for which it is purchased. Attention to such things as correst number of accelerating steps, correct resistance for smooth acceleration, and insistence upon sturdy, heavy resistors will do much to cut down future maintenance. On many drives it will pay good dividends to specify a field failure relay as part of the control, as direct current motors can destroy themselves with the failure of a field circuit.

Wiring and Overload Protection

Assuming proper selection and application of motors, control and other electrical equipment, the next step in preventive maintenance is to see that all wiring and electrical construction work is at least the equivalent of the National Electric Code. If there is the possibility of future expansion of the plant it may pay to put in oversize wiring at the outset.

Every motor should have adequate protective equipment, both for starting and running. Such protection for starting may be oil circuit breakers, air circuit breakers with inverse time limits, or fuses. Even more important is the running protective device. This may be a thermal overload relay, a circuit breaker, inverse time plunger relays, or fuses. The important thing is to select protection with characteristics suitable for the particular drive and conforming strictly to code recommendations.

Mechanical Layout

Most motors, especially high speed drives, should have firm, rigid foundations or supports, and provisions should be made for proper ventilation of both motor and control. If a belted drive is used the first point to be considered is the ratio involved. For good practice the following belt reductions should not be exceeded:

1/15th	hp. motor	15	to 1
1	hp. motor	10	to 1
5	hp. motor	8	to 1
10	hp. motor	6	to 1
20	hp. motor	5	to 1
50	hp. motor	4	to 1

Belts should not be run at speeds above 5,000 ft. per minute. Above this speed there is not sufficient friction contact between belt and pulley because of the centrifugal force which tends to throw the belt. Moreover, the motor pulley must be of ample size to transmit the required horsepower, ordinarily somewhat larger than the motor horsepower rating to take care of possible overloads as well as peak loads. In most applications, 125 per cent of the motor rating should be allowed for a safety factor. Horizontal belt drives are best, with the lower side driving, to allow the upper side to sag, thus insuring the maximum arc of contact. Short center belt drives, V-belt drives excepted,

POWER DISTRIBUTION
MILL No 3 CHILLICOTHE DIVISION

Date ..... Period Starting ..... 19 ....

	Previous Reading	Present Reading	Total K. W. Used	Average K. W. 24 Hrs.	Check
No. 8 Turbine					
No. 9 Turbine					
Pri. 1500 K.V.A. West					
Pri. 1500 K.V.A. East					
Lighting					
Turbine Aux.					
Boiler Room					
Wells					
Pulp Mill					
No. 6 Well					
Beaters					
Filter Plant					
No. 10 Machine					
No. 11 Machine					
		550 V.			
Sec. 1500 K.V.A. West					
Sec. 1500 K.V.A. East					
No. 10 Machine					
No. 11 Machine					
Screen, Bleach					
Rolfold, Recovery					
Digester					
Beaters					
Boilers, Turbine					
Finishing Room					
Tie Line In					
Tie Line Out					

Ave. Vac. No. 8 Turb. ..... Ave. Vac. No. 9 Turb. .....

WELL DATA

NO.	G. P. M.	GAUGE	ELEV.	MIN. ELEV.
1 N. Pump				
S. Pump				575.00
2				559.43
3				565.74
4 N. Pump				
S. Pump				565.80
5 N. Pump				
S. Pump				559.00
6				554.60
7				558.70
8				565.27
9				

Date ..... Signed .....

Left—Power distribution kept track of on this form. Above—Data on water consumption and water levels recorded on this form. Results plotted on a graph which is kept posted on wall of maintenance department.

are bad practice, both for belt wear and motor maintenance. Vertical drives should be avoided whenever possible. The main consideration in applying V-belts to a motor drive is to specify enough belts to allow a liberal margin over and above the actual horsepower needs. This will insure cooler running belts and prevent slippage and consequent belt wear at peak loads.

When gear drives are applied to motors, care should be taken to have solid foundations, liberal size bearings and positive alignment. Helical cut or herringbone gears are much better than spur gears, especially at high speeds. The peripheral speed of gears must be kept within good engineering practice or high frequency vibrations may be set up sufficient to actually destroy the drive motor. All gear drives of 75 hp. or over are better if they have outboard motor bearings to provide rigid support for the pinion gear. A flexible coupling between motor and gear unit constitutes a desirable and convenient method of power transmission.

Because of their compactness, gear-motors are widely used for many drives. They have the advantages over other mechanical linkages of higher efficiency, greater compactness, better appearance, lower weight and greater operating safety. However, it is important that the gear elements be selected to meet working stresses based on peak overloads rather than simply on the normal full-load torque of the motors. A positive interlocked gear mesh acts as a rigid coupling between driving and driven shaft and during periods of excessive overload is subjected to abnormal wear, involving an actual loss of material from the gear teeth. By contrast, an overload on a motor results in overheating only which is relieved when the overload is removed; whereas the gear has suffered an actual loss of material—with consequent damage to the working surfaces of the gear teeth. This damage not only shortens the gear life, but when repeated sufficiently may result in gear failure.

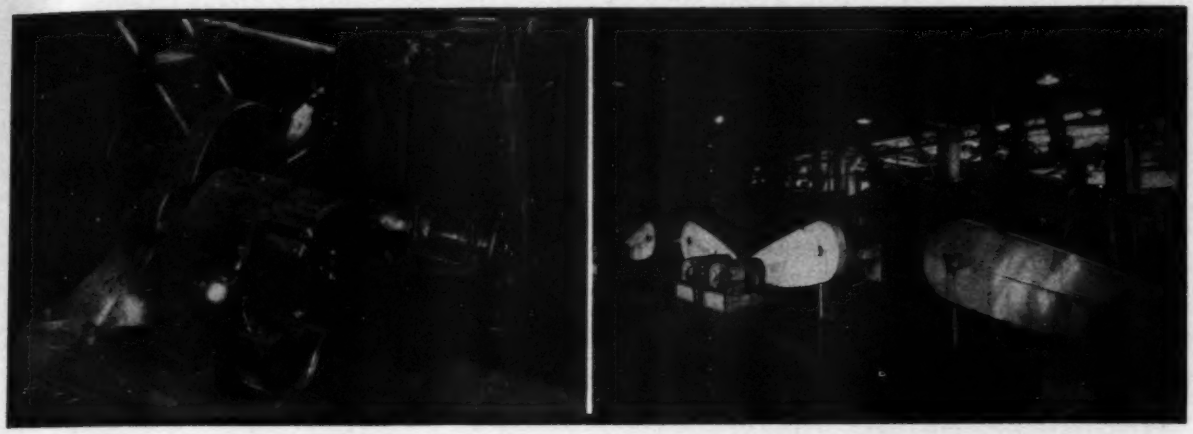
For example, if an installation is rated 5 hp., but has frequent overloads, with peaks equivalent to 7½ hp., the motor can be selected on the basis of a 5 hp. rating. The gear, however, should be selected on the basis of frequent overloads, which means that it should have a normal rating of 7½ hp.

The general purpose gear, having a service factor of 1, is used where the service is eight to ten hours per day with a load involving no pulsations and infrequent starting. If the service is twenty-four hours per day as in paper mills, a special purpose gear with a service factor of 1½ should be used. Drives involving shock loads, frequent reversing, or numerous starting and stopping operations should have especially careful consideration.

Simplifying Electrical Maintenance

In general, it may be said that the larger the plant the more difficult it is to properly service your electrical equipment, and at the same time keep within a reasonable cost per ton of product produced. Maintenance, like insurance, is very desirable; but some companies are willing to spend more for it than others. Much depends upon the size of a plant, value of its product, and the policy of the management regarding lost time due to inoperative electrical equipment. Perhaps, the greatest problem is to achieve a proper balance between the number of men required through the week and on Sundays or week-ends. Since most mills shut down only on Sunday for repairs, quite a few men are needed to make the necessary inspection and minor repairs. If sufficient men are provided to take care of all Sunday work, there will probably be more than are needed for the week days. Very careful planning and scheduling are neccessary, therefore, to maintain a modest-sized electrical force, and still get good results. Advantage must be taken of any possible equipment shut downs on week days and schedules must not be made more exacting than practical.

It is, of course, possible to set up very elaborate routine systems with many forms requiring much book work. However, for large plants, it is well to keep printed forms and scheduling methods as few and as simple as possible, consistent with good results. In the Chillicothe division of The Mead Corporation an elaborate maintenance system was in force as far back as fifteen years ago. However, as the plant has expanded it has been our policy to simplify our records and forms. The biggest reason for this has been that the plant has become so large that we can no longer give all equipment the minute care we formerly did. As a mill grows larger it frequently becomes more economical to



Left—A 1-½ hp. 550-1650 r.p.m. watertight d-c. adjustable-speed motor used for shake drive. Right—Pulp deckers driven by gearmotors.

carry more spare motors and countenance some failures, than to spend too much for labor.

The Chillicothe plant consists of eleven paper machines, two soda pulp mills, an old paper conversion plant, a pulp bleaching plant and a coating department. There are two complete power plants, one generating at 600 volts and the other at 2300 volts. These two power plants are connected together by a tie line and transformer bank, so power may be exchanged either way.

Personnel of Department

The electrical personnel to service this layout consists of a chief electrician, assistant foreman, eight tour electricians and a day force of nine men, four of whom are helpers. The eight tour men are divided up, two on each tour or trick, the mill operating four tricks. These tour electricians are the key men of the electrical department and must be skilled men of wide experience. They are responsible for operating the power houses at night, the switchboards at all times, and starting up and shutting down turbines, and putting them on the line. They cover the whole plant, inspecting all motors three times each twenty-four hours, replace burned out lamp bulbs, and oil all sleeve bearing motors. The inspection of a motor is a matter of only a few seconds for the experienced tour man. The man on one trick only carries an oil can and adds oil to bearings where needed. These men make all minor repairs to the numerous cranes, elevators, and conveyors. They are, in fact, the trouble shooters for the whole mill, and can be summoned to any point by means of an auto-call system. The tour men are required to keep a log book, detailing every call made, and reporting any condition needing further attention from the chief electrician or day repairmen. Thus these men become virtually the eyes of the chief and much of the scheduling depends upon their observations and reports.

The chief electrician reads the log book the first thing every morning to get a picture of the last twenty-four hours out in the mill. The day force do all the major repair work, shop repair work, rewinding of motors and all major overhauling of any equipment from a crane to a storage battery. They also do all new construction work such as wiring and installing motors, switchboard, transformers, lighting systems, etc.

On Sundays, all repair work has been laid out in advance, either from our tickler schedule system or such work as deemed necessary by the chief electrician. All men, both tour and day workers, are given certain assignments. In addition, two extra men work all day, Sundays, cleaning motors with compressed air.

Starting up the mill Monday mornings is quite important from a maintenance viewpoint. The tour electricians take care of the power houses and switchboards, synchronizing turbines as the load comes on. Other tour men start up all deep wells supplying water to the plant, as well as booster pumps, and the filtration plant. One day electrician and helper are assigned to assist in starting up each of the four paper machines. They likewise start up all motor generator sets, jordan motors and, in fact, all large or key motors on the machines, and stand by to see that all small motors are correctly started, before reporting to the shop for their routine work.

Records

Years ago we found that two important sources of motor failure were single phasing and damage due to worn or hot bearings resulting in contact between rotor and stator of the motor. The principal remedy for single phasing is to maintain proper contacts in motor starters. Experience indicated that a thorough inspection every 30 days was sufficient to maintain compensator controllers and also other reduced voltage equipment. Full voltage starters of the magnetic contactor type are inspected every two months. In order to prevent rotors from rubbing against stators we gauge the clearance between the rotor and stator with feeler gauges every three months. This work is scheduled by means of a simple tickler file with twelve divisions, one for each month of the year. Each division has thirty-one index cards, one for each day of that particular month. The inspection cards, with details of the particular inspection or repair work desired are filed under the date on which inspection is to be made. As the jobs indicated on the inspection cards are taken care of, the date is marked on the card which is then moved along in the file to the date for the next inspection. With this file any job may be scheduled ahead for any interval of time, with the assurance it will not be overlooked.

In addition to starter repairs and gauging motors we schedule such jobs as greasing anti-friction bearings, lubricating flexible couplings, inspecting crane cables, testing transformer oil, relay testing, inspecting and adjusting oil circuit breakers on the main switchboard, and other, smaller jobs which otherwise might be forgotten or neglected. The cards are marked with the date and the name of the electrician making the inspection.

For some jobs we require a graphic record in addition to a file record. For instance, all large units such as turbine generators, motor generator sets, exciters, transformers, synchronous motors, and, in fact, all large key motors are given a resistance test with a megger every six months. The megger readings are plotted on special cards, the resulting curve indicating the condition of the insulation, and—what is more important—whether it is deteriorating.

Vibration readings are taken at every bearing on our

turbo generator units once a week and the resultant readings are plotted in a continuous curve. These readings are taken directly on the shaft with a vibrometer and the results are plotted in mils. With this system the slightest change in balance or vibration is made known to the operating engineers.

Specific gravity readings of storage batteries used to drive our fleet of electric trucks are similarly recorded and plotted, so that the condition of each battery is always known. Frequently it is necessary to make watthour meter tests of motors with recording instruments. Representative strips of the chart are pasted in file folders, together with name plate data, and load conditions on the motor, and kept as a permanent record.

Another important inspection is that of power circuits. Complete circuits are tested with a megger once every six months and the results plotted as a curve. One megohm or over is considered good enough unless previous readings indicate progressive deterioration. If under one megohm, the circuit is sectionalized and investigated for weak insulation or grounds. Such close attention to heavy feeder circuits tends to minimize short circuits, which may be disastrous when backed up by a large generating capacity.

Cost System

An important part of our maintenance system is the cost record file. All electric work of any description requires a work order, either from a foreman, a superintendent or the chief electricion. This work order is routed through the central maintenance office by the work dispatcher. Time and material are charged to the proper department and allocated to the equipment involved. Thus the maintenance department has a record of total costs for every motor drive in the mill. In addition to this, the electrical department itself keeps a separate system of cost cards on which are recorded only the labor and materials needed to maintain the equipment. For instance, painting a motor or taking it apart for a general cleaning up is not considered necessary to keep it in continuous operation, and is, therefore, recorded only in the central maintenance office.

On the other hand, labor and materials used in restoring a motor or other electrical equipment to running condition are recorded in the electrical department's set of maintenance cost cards, and the charges against each piece of electrical equipment totaled once a year. If any costs are found to be running up substantially, an investigation is immediately made to find the cause. In many cases it is found that a worn or misaligned mechanical part, or an otherwise increased load on the equipment is what is causing the trouble. Such cost records automatically bring a faulty drive design or poor application to the attention of management and make a convincing argument for the chief electrician when suggesting changes to the mill manager.

Plant Surveys

In spite of the utmost care in the installation of plant wiring, motors, controls and protective features, they cannot be expected to remain in that condition without periodical overhauling. Motors will become overloaded, voltage will drop on some feeders, and fuses, overload relays and circuit breakers will be found changed or tampered with. Especially in large and expanding mills will conditions get out of hand.

To make necessary revisions from time to time and to eliminate losses, every plant utilizing electric power, whether purchased or generated, should make a periodic survey of its load conditions, and at the same time investigate all motor and control protective devices. All fuses should be checked for proper size and fuse links; all temperature overload relays examined to see that proper size heaters are being used, are properly adjusted, and in working order; all oil or air circuit breakers tested for the correct settings and, if equipped with oil dash pots, checked for proper grade of oil. At the same time, voltage, current and possibly recording watthour meter readings should be taken at each motor. The size of branch circuit wire, and feeder should be noted, and a temperature reading taken of the motor. With all this information recorded on suitable forms, a complete study of the electrical layout can be made and faulty conditions corrected. Motors, for example, which are underloaded can frequently be exchanged with motors elsewhere in the plant which are overloaded—with a resulting improvement in power factor.

A source of energy loss often overlooked is that due to low voltage. Since the torque of an induction motor is proportional to the square of the applied voltage, any drop in voltage tends to overheat the windings, with a consequent overloading of the cables, and a direct energy loss. Similarly a higher voltage than specified for the motor tends to lower its power factor.

Low lagging power factor is caused by underloaded induction motors, causing heat loss in the motor windings, cables, and transformers. This heat loss is a direct energy loss, since it must be paid for either as a penalty through the power bill or in reduced capacity of transformers, feeder cables, and generating equipment.

Friction load on most applications is not always readily measured. Where the drive is direct coupled, and the load is abnormal, it may be due to tight bearings, bearings out of line, coupling faces not properly lined up, worn bearings, or lack of lubrication. When all these items are carefully checked, the source of the abnormal load is usually apparent. When the transmission between the motor and load consists of belts, chains, gears, etc., each item should be especially well checked.

Most industrial plants expand from time to time, and although it is customary during the initial installation to supply a certain reserve capacity in the distribution cables, unless a close check is made and records kept, it is quite an easy matter to assume that the cables are heavy enough for additional loads, when, as a matter of fact, they are not. Often the cost of increasing the cable sizes has been paid many times over in the heat loss of undersized cables.

When a systematic load survey is periodically made and records kept, any discrepancy in the load is easily recognized and the way is paved for more economical plant operation.

In the last analysis,preventive maintenance involves many factors, the more important of which, as discussed here, include (1) proper installation of equipment in the first place, (2) adequate inspection to anticipate and avoid the causes of major repairs, (3) simple but effective records for insuring these inspections and minor repairs, and finally, (4) a yearly survey of plant equipment and wiring to see that the good work is being maintained.

(EDITOR'S NOTE: Illustrations on pages 861 and 863 furnished through the courtesy of Reliance Electric and Engineering Company.)

University of Washington

Completes new Pulp Laboratory

KENNETH A. KOBE
Department of Chemical Engineering
University of Washington

Right—Bagley Hall, University of Washington. Chemistry, Chemical engineering, pharmacy building.

▶▶▶ THE UNIVERSITY OF WASHINGTON completed last year a new building for chemistry, chemical engineering, and pharmacy at a total cost of approximately $1,400,000. Many of the features of the Department of Chemical Engineering are of particular interest to the pulp and paper industry. As this industry is the largest chemical processing industry in the Pacific Northwest, certain facilities of the new laboratories have been devoted to this industry. The Department always has been interested in and cooperated with the pulp and paper industry on their research problems. Lack of facilities in the old building limited the work that could be done. However, in the new building have been included a series of laboratories where research work concerning the industry may be carried out. The plan of these laboratories is shown diagrammatically in illustration. The northwest corner of the basement floor of the building is devoted to these laboratories.

Student Facilities

During their third college year, all chemical engineers take a course in Industrial Chemistry, which includes engineering materials, inorganic and organic chemical industries. The laboratory work is conducted in the corner laboratory. Adjacent to this is the gas and fuel laboratory for the special calorimetric and analytical equipment. During the spring quarter, the laboratory work is devoted exclusively to the pulp industry. The student prepares the pulping liquor of one of the standard processes, analyzes it, pulps wood chips until satisfactory pulp is obtained, and analyzes his pulp for both its chemical constituents and its physical properties. Other experiments deal with cellulose and its derivatives.

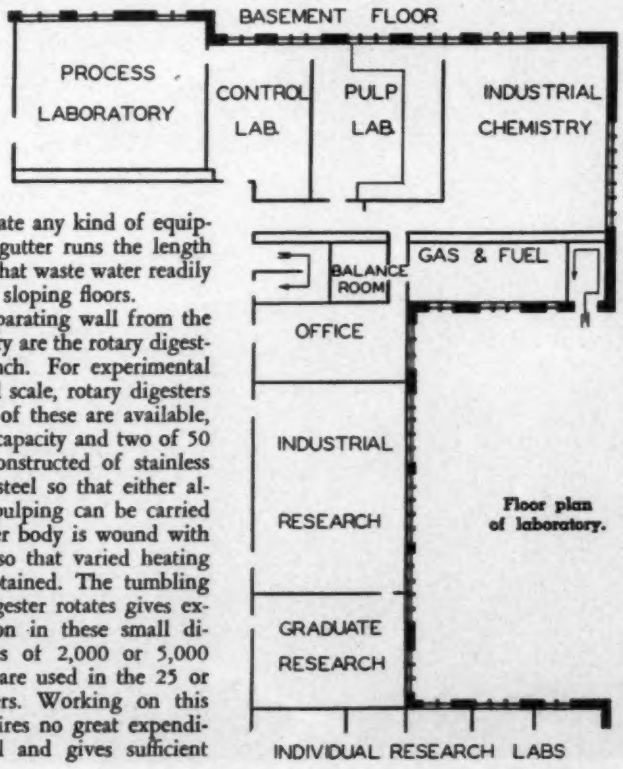
Pulp Laboratory

Adjacent to the student laboratory is the pulp laboratory containing the heavy equipment used for this work for both student instruction and research projects. This laboratory is 19x33 ft., and is equipped for heavy equipment. Special utility lines supplying high and low pressure steam, compressed air, gas, hot and cold water, direct and alternating current make it possible to operate any kind of equipment. A large gutter runs the length of the room so that waste water readily drains from the sloping floors.

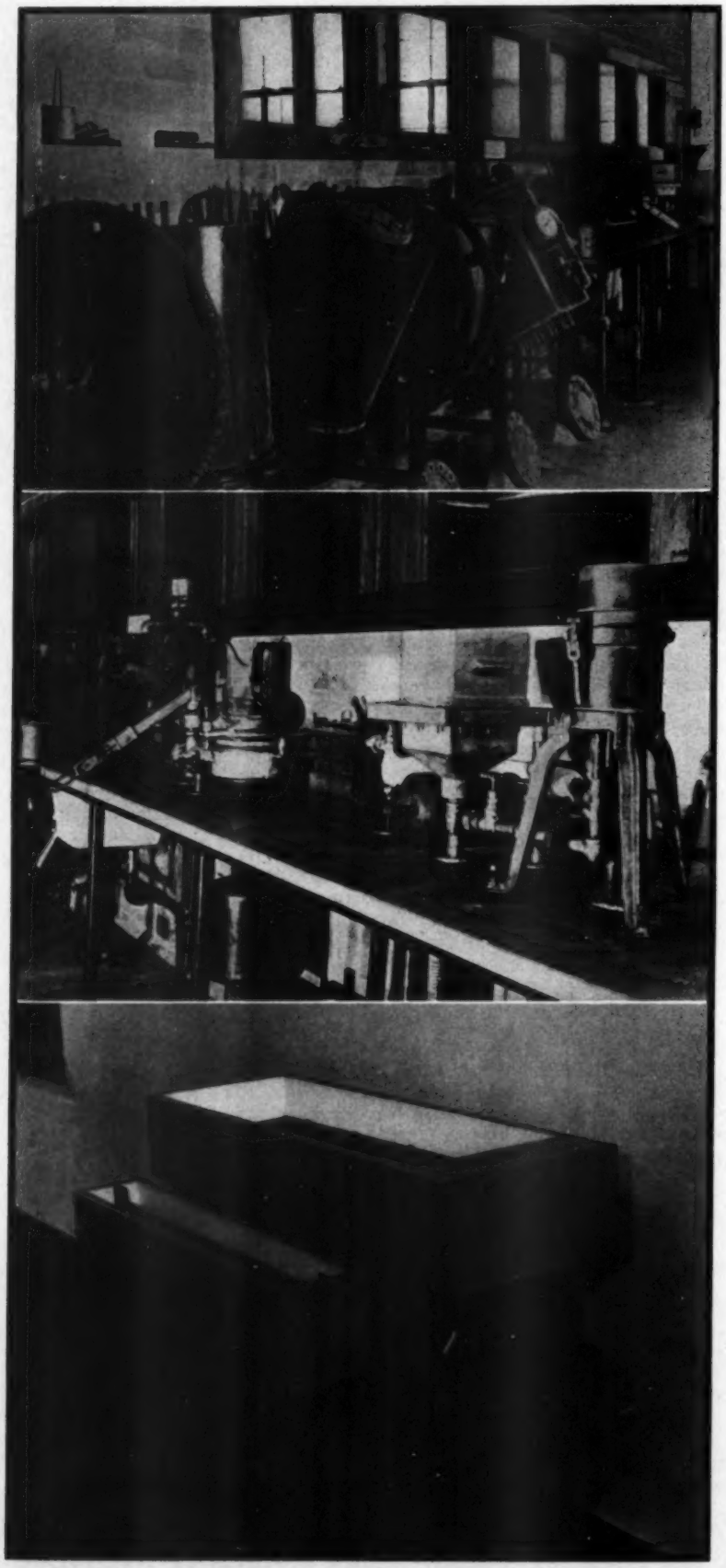
Along the separating wall from the control laboratory are the rotary digesters and test bench. For experimental work on a small scale, rotary digesters are used. Four of these are available, two of 25 liter capacity and two of 50 liter capacity, constructed of stainless steel and mild steel so that either alkaline or acid pulping can be carried out. The digester body is wound with resistance wire so that varied heating rates can be obtained. The tumbling action as the digester rotates gives excellent circulation in these small digesters. Charges of 2,000 or 5,000 grams of chips are used in the 25 or 50 liter digesters. Working on this small scale requires no great expenditure of material and gives sufficient pulp for test purposes. The data obtained here may be translated to the semi-plant digester for verification on a larger scale. The test bench adjacent to the rotary digesters has the usual mill equipment of sheet molds, press, dryer, freeness tester, and Valley beater. A small Valley screen is used for the small batches of pulp produced in the rotary digesters.

Semi-Plant Equipment

While the new building was being designed, plans also were being made



Floor plan of laboratory.



for semi-plant scale equipment in which pulping could be studied on such a scale that the results could be translated directly to mill practice. A *W.P.A.* project was set up for the design and construction of such equipment. All pieces of equipment were co-ordinated in size to give uniform operation. Designs were drawn up and from these were made the patterns for the special metal shapes. The castings were machined and all construction completed in the department shop. The fabrication of the digester body was the only piece of work done outside. Designs and patterns are made available to others who wish to construct such equipment.

The semi-plant equipment is installed along the wall adjacent to Industrial Chemistry and a 5-foot balcony hung along this side and partially across each end to give additional floor space. This serves as an operating floor for the digester and bleacher, and to support the storage tanks for the pulp suspension before screening. The digester is fabricated of $\frac{5}{16}$-inch stainless steel plate, allowing either acid or alkaline pulping, and the strength is such as to allow the use of temperatures and

Above—Battery of Rotary digesters. Capacity 25 and 50 liters. Center—Pulp testing equipment adjacent to control laboratory. Below—Flat screen—four Crodon plates.

pressures above present mill practice. It holds approximately 60 pounds of chips when filled. Heating and circulation are carried out through an external heat exchanger which is large enough to bring the digester up to maximum temperature in one hour. Direct steam can be introduced into the liquor while external circulation is maintained. Circulation can be carried out in either direction, though downward circulation is usually employed. Temperature and pressure in the digester and the temperature of the hot recirculated liquor are recorded on Taylor instruments.

The digester blows to a wooden blowpit which is connected directly to a fume duct running to the roof of the building. The waste liquor can be drained from the bottom of the blowpit and saved for further experiments, or the pulp can be washed in the blowpit before dilution. After dilution in the blowpit, the suspension is pumped through the knotter and up to the storage tanks on the balcony. From these, the pulp goes to the flat screen where it is diluted with additional water. The flat screen has four Crodon plates, 11 by 18 inches, and is operated by a modified Dunbar type

of drive. Excellent capacity is obtained with very little noise in operation. The screened pulp goes to a washer-thickener for water removal, or to a wire screen box washer, or to a dewatering device on the top of the bleacher, from which the pulp slides into the bleacher. Unbleached pulp may be removed and pressed into cakes. For bleaching, the pulp goes to a tile-lined bleacher in which the pulp comes in contact with only tile- or rubber-covered metal. The bleacher, operated from the balcony, discharges into a wire screen box below where washing and dilution of the pulp take place. The pulp may be re-screened before pressing into cakes.

Control and Process Laboratories

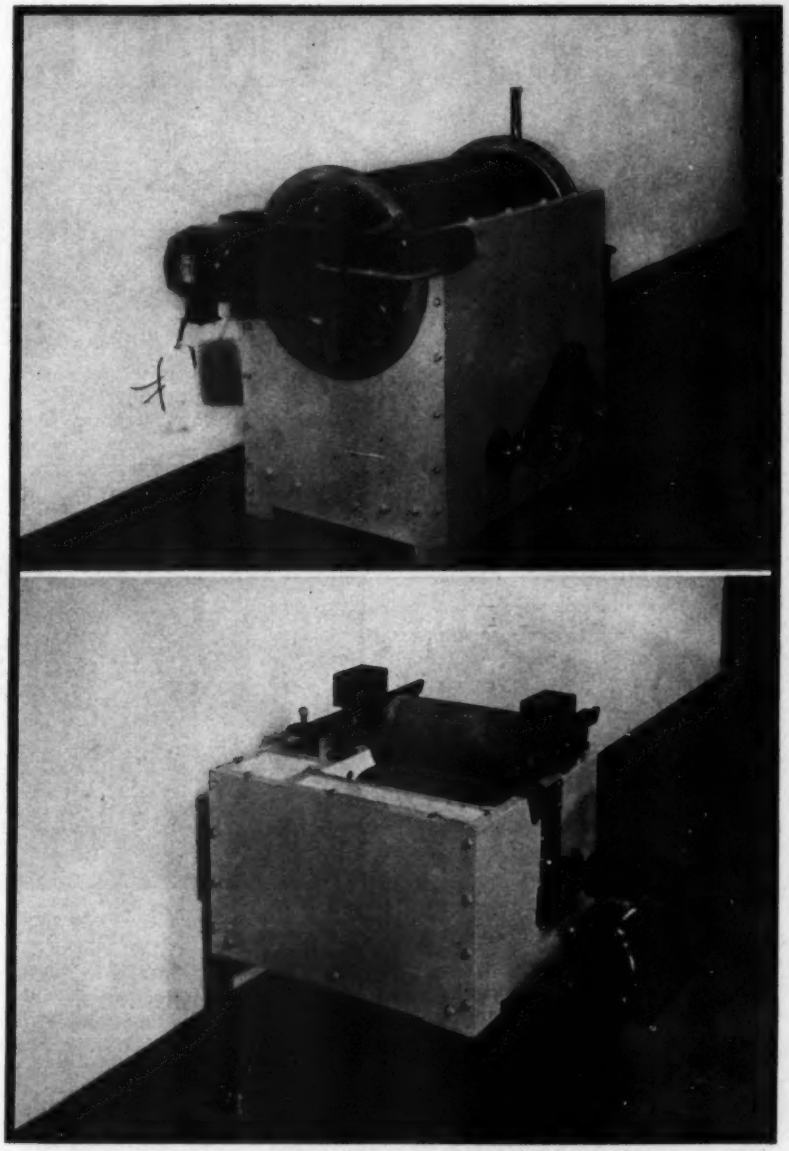
Adjacent to the pulp laboratory is the control laboratory (21 by 33 feet) and separated from it by a wall having re-light windows (seen above the rotary digesters and test bench). This enables the worker at the laboratory bench in the control laboratory to watch the operation of his equipment in the pulp laboratory. The control laboratory is equipped with regular laboratory benches and desks to which students working in the pulp laboratory may be assigned. Fume hoods, drying ovens, balances and chemical laboratory equipment are available here.

The process laboratory is on the other side of the control laboratory from the pulp laboratory, and likewise has the re-light windows in the wall. This laboratory is 38 by 30 feet in size, has a large gutter in the floor and all large utility lines of the pulp laboratory also pass through this room. Concrete benches are against two walls of the room and a large concrete sink allows large vessels to be washed, or the sink may be used as a cooling or heating bath. The purpose of this laboratory is to give space for the erection of special equipment for processing wood, wood products, pulp, waste liquor, etc., on the same semi-plant scale used in the pulp industry. Thus, a large steam still is used by various research men in organic and pharmaceutical chemistry to separate volatile oils from leaves, stems, bark or roots, for the study of these plant derivatives.

Research Facilities

Research on problems of interest to the pulp and paper industry is carried on in a number of different laboratories. The laboratory labeled Industrial Research is devoted principally to senior thesis work. All seniors in chemical engineering must carry out an original investigation and report it in a senior thesis. Man of these men work in the control and pulp laboratories but those men not requiring the large scale facilities use the desk space in this large research laboratory. Adjacent to this is a graduate research laboratory where graduate students working for the Master of Science degree carry on their research. Around the corner are individual research laboratories assigned to men working for the Doctor's degree. Research on lignin, p-cymene, sulphur dioxide and others are being carried out.

In the other end of the basement is the large two-storied unit operations laboratory where senior chemical engineering students study the unit operations, as heat transfer, flow of fluids, absorption, drying, filtration, etc. Much of this equipment is used to teach the principles of these operations as conducted in pulp mills. Adjoining this laboratory is a research laboratory for unit operations. Here is conducted the work on the system $CaO—SO_2—H_2O$ and rate of absorption of sulphur dioxide in bisulphite solutions, and other important research projects.



Above—Knotter. Below—Washer-Thickener.

Pulping of Douglas Fir

The most important problem to the logging and lumbering industry of the State is the utilization of the low-grade logs and lumber, which either must be left in the woods or sold at a loss on the lumber market. A co-ordina-

(Concluded on page 872)

CONTAINER *Tops Again*

C. C. HARRINGTON

So gratifying have been the economies and performance of the high pressure venture of the Container Corporation at its plant in Manayunk, Philadelphia, that when the problem of effecting economies and replacing obsolete equipment at its Carthage, Indiana, plant came up for consideration, there was no hesitancy in establishing the general scheme which the new design* would follow.

The idea of the high pressure "top" had been more than justified for this particular industry and the dependability of high capacity and high pressure equipment had been proven.

An analysis of the economies of this particular plant revealed that a high pressure installation would, when the plant was producing its average of 120 tons of board per day, reduce the hourly steam requirements from about 80,000 lb. to 59,000 lb. Of this, 59,000 lb., all of which is produced on the new 600-lb. boiler, 57,600 lb. passes through the new turbine "top," producing 1200 kw. This makes possible the electrification of former steam units and relieves the older turbine of load formerly produced by passing steam to the condenser, thus resulting in the steam savings noted.

Anticipated savings in annual operating costs based on 1937 production are estimated at slightly more than $50,000; after allowing for depreciation on the new investment, taxes, insurance, etc.; representing a reduction of $1.64 in the cost for power and steam per ton of product. The design allows for production of 155 tons of board per day, at which production the cost would be reduced $1.69 to $1.75 per ton. Such savings would have warranted replacing existing equipment even if its continued dependable operation had been possible.

There remained only the selection of equipment best suited for the available fuel; in this case, Indiana strip mine bituminous coal, and feedwater taken from an adjacent stream which varied in hardness between 5 and 20 grains per gallon.

(*) Engineering and construction work done by H. M. Wilson Company, Philadelphia.

The Carthage plant was originally built as a straw mill, being located in the heart of a farm territory from which it draws its raw material within a radius of about one hundred miles. Its product is used primarily for corrugated filler of container board. In recent years one of its three machines was converted for liner board. The plant, built about forty years ago, has changed hands several times, and when the Container Corporation took possession, the power plant had been operating with maintenance considerably behind. Maintenance allowances had been curtailed to the point where rapid deterioration was inevitable.

Exterior view of the power plant.

The boiler plant consisted of two Heinie boilers rated at 500 hp. each, and one Erie City boiler rated at 557 hp. These three units were fired by means of single retort side stokers and to produce the average requirements, it was necessary to drive them at almost 200 per cent of rating continuously, which could be done only by burning the more costly West Virginia coal. A fourth boiler was abandoned and removed to make way for the new unit.

Forced draft was provided by one large engine-driven fan which was continuously giving trouble. Water for the boiler feed was treated by means of a standard hot process lime and soda softener. Returns were collected in a hot well from which they were pumped to the heater, but the introduction of raw water at the paper machine vacuum pumps resulted in an 8 to 10 grain mixture so that correct chemical feed was impossible. Coal was delivered by car to track hopper and conveyed to overhead bunker from which it was spouted to the several stokers. Ashes were carried by means of the same conveyor and deposited to cars or ground storage.

Nearly all current was produced on a 1500-kw. bleeder condensing turbine, operating from 160 lb. to 10 lb. extraction and condensing. All mill water was pumped through the condenser as circulating water and was at all times adequate. Very little current was purchased and an old 200-kw. Chuse engine generator was available for shutdown emergency.

Since the present boilers were capable of carrying the average load, even though with difficulty, it was decided to overhaul and make them available as stand-by, and limit the capital expenditure to one new unit capable of carrying the entire load. This was located near an existing steel stack into which the new induced draft fan was discharged. The plans call for a second unit of like size on the other side of the same stack.

The old engine-driven fan was re-

moved and two new motor-driven units now serve either the new or old boilers. The old 160-lb. pumps were relocated alongside the new 650-lb. pumps, making room for an additional filter and new chemical mixing and feeding equipment.

The space formerly occupied by an old rope drive engine made an ideal location for the new 1500-kw. back pressure turbine, while the pressure reducing valves and desuperheaters are located on the adjoining wall. Steam is conveyed from the new boiler, through the new turbine "top," or reducing valves and delivered back into the original 160-lb. system.

An initial pressure of 600 lb. and 175 degrees superheat was considered most economical in view of the 160-lb. back pressure which would be required for existing engines. The new boiler was built for a continuous rating of 80,000 lb. per hour and 100,000 lb. peak. The boiler itself contains 9,010 sq. ft. of heating surface, or 61 per cent of the total. The waterwalls contain 846 sq. ft., or 5.7 per cent, the superheater 420 sq. ft., or 2.9 per cent and the economizer 4510 sq. ft., or 30.4 per cent. The shell of the lower drum, which is 42 inches in diameter, is 2 inches thick. All drums are fusion welded.

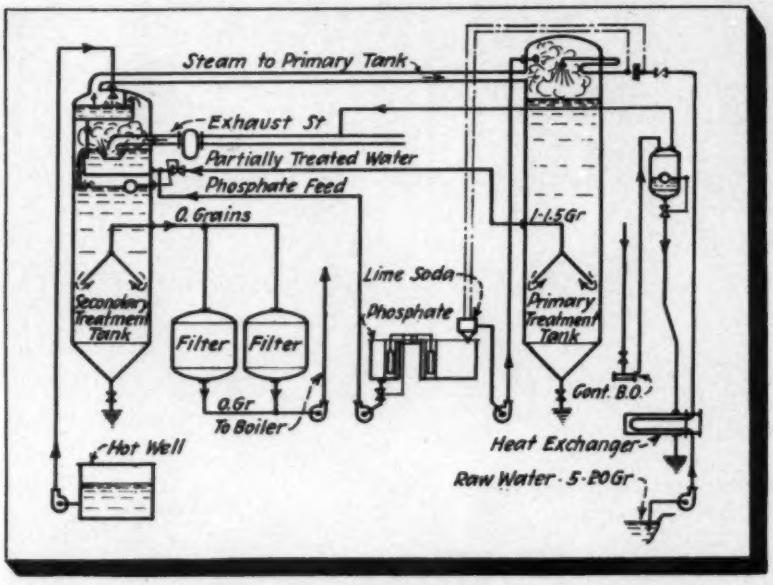
Waterwall tubes are backed with refractory tile, high temperature insulation and gas tight steel casing plates. The roof of the boiler is constructed in similar fashion, while all brick walls are backed with 85 per cent magnesia block and steel casings.

The furnace contour is designed especially for low grade Indiana bituminous coals, with the wide throat, high front arch, and long low rear arch, arranged to encourage the lean gases from the unburned portion of the bed to mix with the richer mixture being released near the front before passing up into the tubes. The wall header extends the full length of the stoker to form what is known as a clinker chill. Conventional baffle arrangement and soot blowers are provided. Rear soot hoppers are arranged for dumping onto the rear end of the stoker through openings in the rear suspended arch.

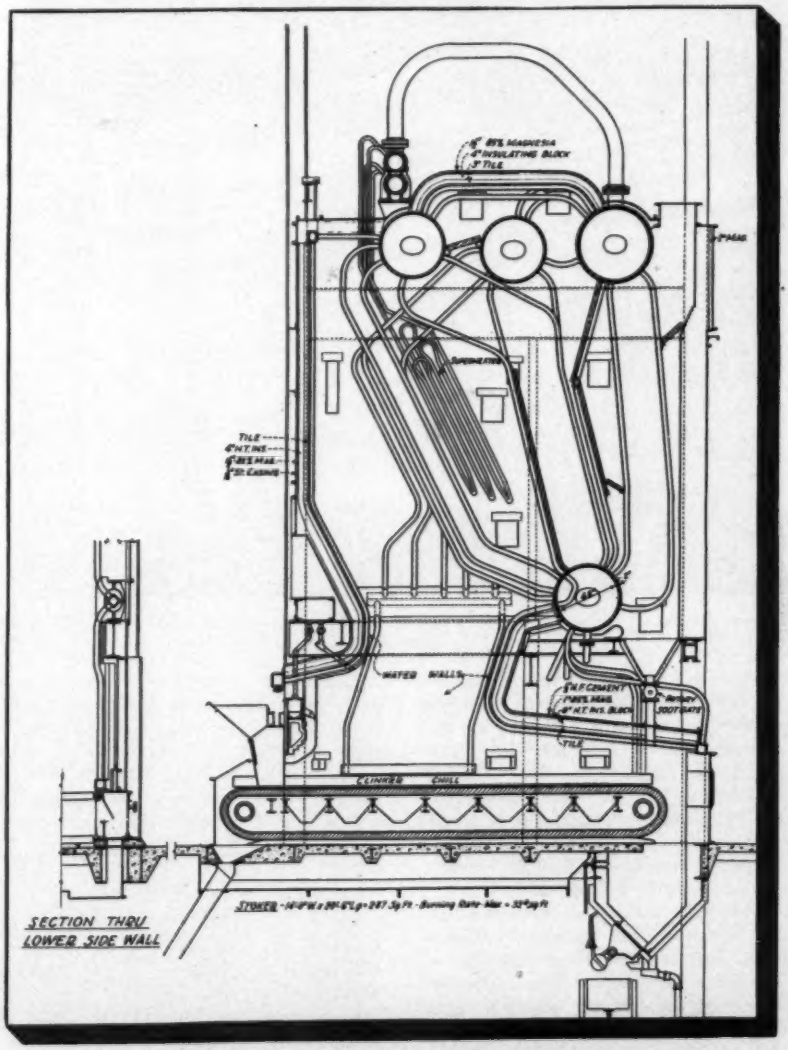
The fuel most available and at the most advantageous price is Indiana bituminous secured from strip mines. This fuel is a very free burning, long flame coal, high in volatiles, having the following approximate analysis:

Moisture	11.6
Volatile	37.7
Fixed carbon	37.2
Ash	13.5
	100.0
Sulphur	3.5
B.t.u. wet	11,064
B.t.u. dry	12,501

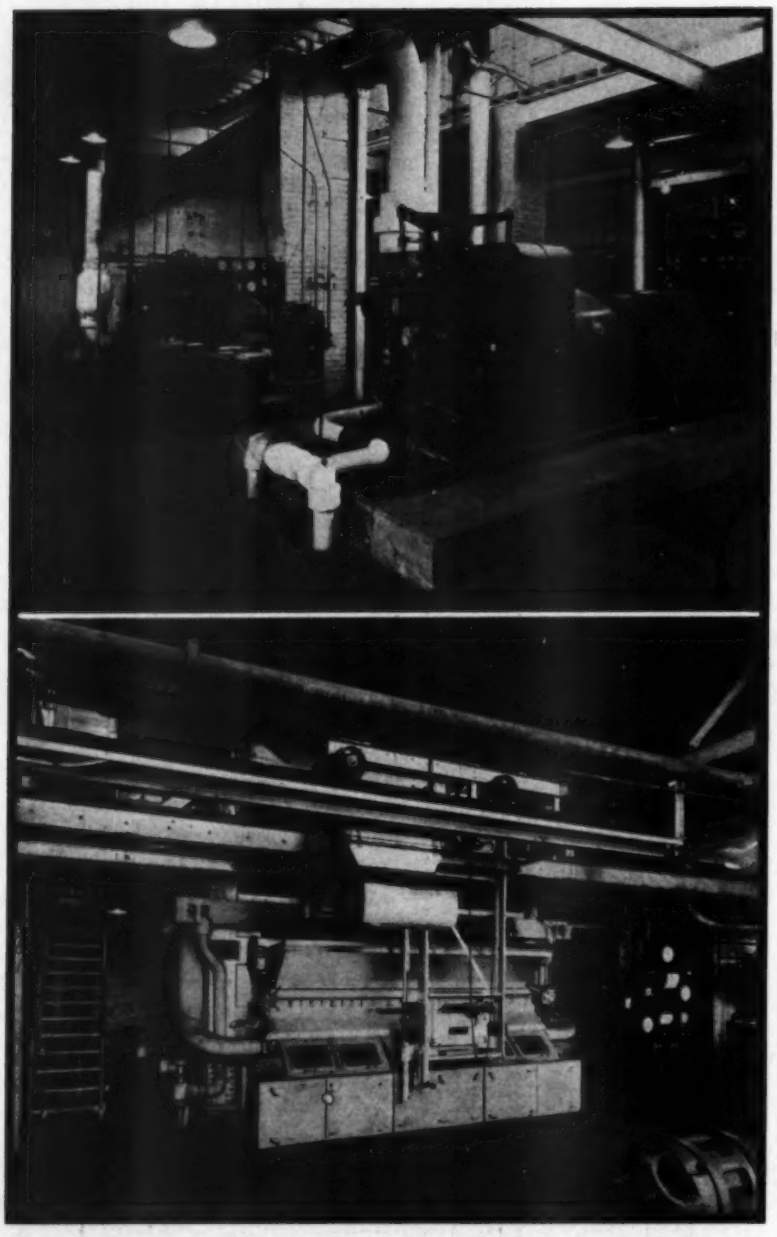
Fusing temp. 2100 to 2400 degrees.



Water treatment diagram.



Elevation diagram of boiler and stoker arrangement.



Above—The new "topping" turbine. Below—Boiler and stoker, showing the attractive front shielding of the latter.

This coal is very difficult to pulverize, and being non-clinkering does not require the agitating action of an underfeed stoker. The traveling grate stoker has been found very suitable for burning this fuel, and was selected in this instance. The stoker is 14 ft. wide by 20 ft. 6 in. long, an area of 287 sq. ft., giving a maximum burning rate of about 32 lb. per sq. ft.

The high volatile content of this coal necessitates special measures to assist in its combustion and prevent smoke. There is, for instance, the matter of tempering the coal with water in summer, and with steam in winter. In spite of the fact that this coal contains about 10 per cent of natural moisture, water or steam is added to bring the content to 15 per cent in order to make it "burn better."

Then there is the application of overfire air, and sometimes steam. In spite of the retarding action or distillation of volatiles attributed to tempering, the rich mixtures present in the first stages of combustion are inclined to pass into the tube spaces before they have had an opportunity to burn out completely; resulting in smoke and poor efficiency. Jets of air are introduced across the front arch which direct the rising gases back onto the incandescent surface of the fuel bed to be further consumed before finally leaving the furnace. This air is provided by a separate small fan capable of 6-inch pressure at all times. Steam jets introduced at the corners just below the ignition arch are also provided, but these are not used except where the greatest degree of smokelessness is compulsory.

The stoker installation is rather an innovation and shows what can be done toward good housekeeping where stokers, hoppers and larries are concerned. Aluminum paint also has proved a great aid in exposing accumulations of dust and dirt which only the most indifferent operators would tolerate. The result is a boiler house that is kept spotlessly clean at all times.

Estimated boiler performance is shown in Table I below.

The coal bunker has been rebuilt in its original position and a two-way larry makes it possible to feed both the new and old boilers. The existing conveyor, track hopper, crusher and apron feeder were salvaged. New forced draft fans are located at the firing floor level. The induced draft fan and economizer are located in a room above, the fan being driven by a variable speed motor controlled from a momentary contact button on the gauge board.

A by-pass connection is provided to the stack so that the economizer can be taken out of service and the boiler operated at reduced rating. Roomy grating walkways are provided at numerous levels, connected by easy stairs, making all valves and doors easily accessible.

The boiler gauge board includes every instrument required to show and record each factor which affects the performance of the unit. There is the illuminated pressure gauge, the ammeter and kw. meter showing the fan operation, the multiple pointer draft gauge showing windbox pressure, overfire pressure, furnace draft, draft entering and leaving the economizer, a re-

Table I

	Steam Production per hour		
	60,000 lb.	80,000 lb.	100,000 lb.
Over-all efficiency	84.5	83.4	82.0
Gas temp. leav. boiler	620	685	750
Gas temp. leav. econ.	362	400	441
Water temp. ent. econ.	212	212	212
Water temp. leav. econ.	313	323	336

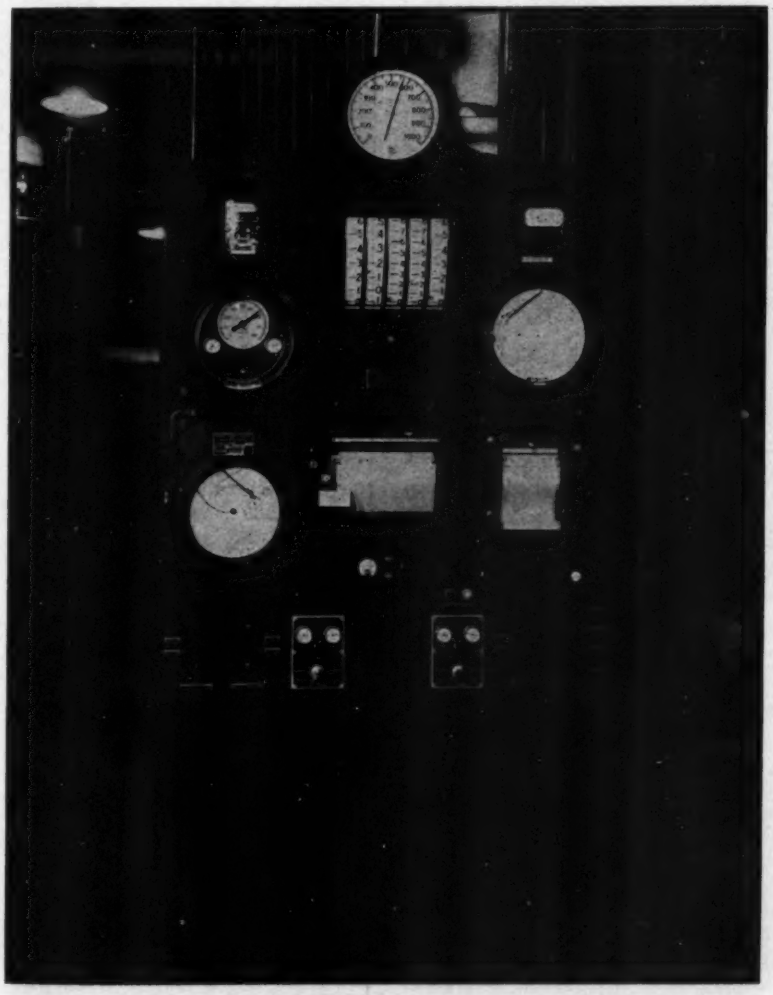
cording pressure gauge for steam and boiler feed pressure. There is an air-flow steamflow meter, a six-point potentiometer recording temperature of water entering and leaving economizer, exit gas entering and leaving the economizer, saturated and superheated steam temperatures, and an electric CO_2 recorder. The board also contains the combustion control dials and adjustments, and control buttons for induced and forced draft fans.

The combustion control equipment is arranged to automatically control forced draft, and uptake draft from header pressure. Every provision is made for future fuel control with air ratio adjustment. An "Eye Hye" device makes the water line visible at the firing floor level.

The water conditioning system is rather unique in that it incorporates a new development in hot process method of softening. The plant originally had installed a 12,000-g.p.h. Cochrane hot process water softener equipped with a tray type of heater and one 8 ft. diameter filter. The system then installed was not adequate for the new high pressure boilers as it did not provide for deaeration, handling of oily condensate, or an after treatment of phosphate. These three features, however, were incorporated in a two-stage hot process softener which is illustrated diagrammatically in the water treatment diagram.

Table II

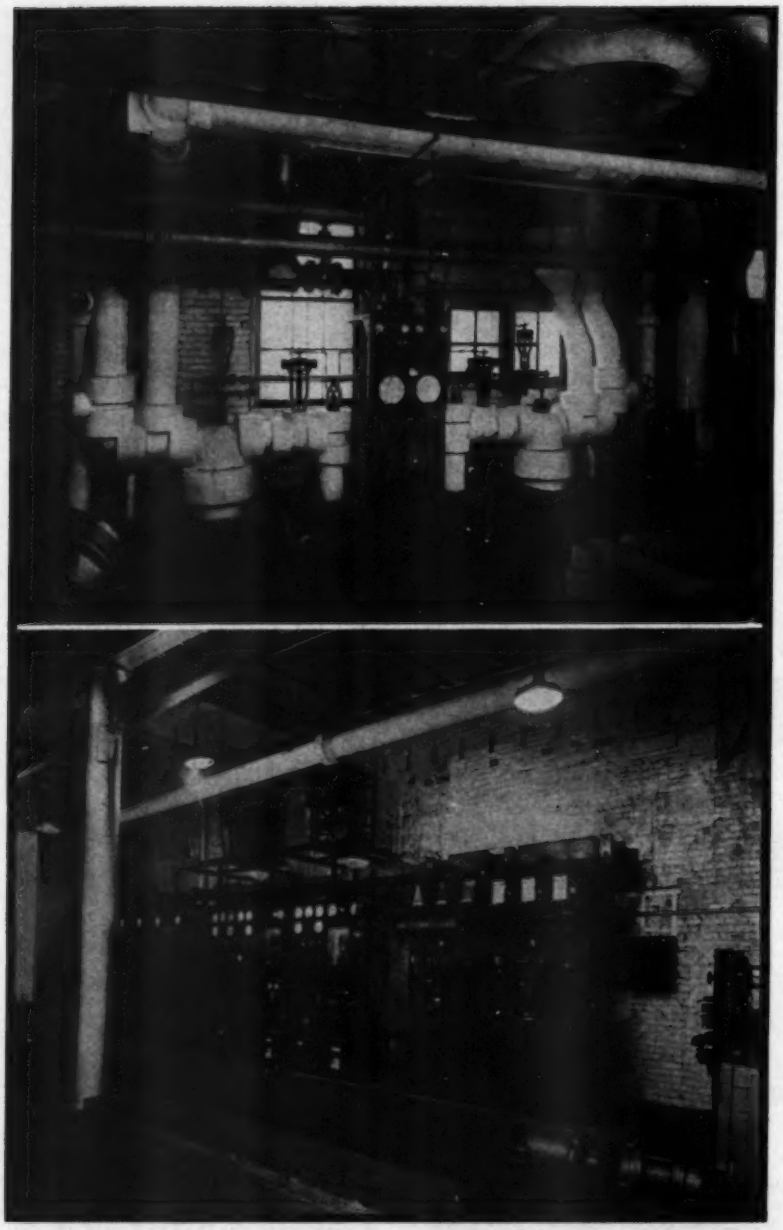
	Raw Water	Water Leaving Primary Tank	Water Leaving Secondary Tank as Entering Boiler	Boiler Blowdown	Saturated Steam
Turbidity as SiO_2	Very slight trace	None	None	Very slight trace	None
Suspended matter	Present	None	None	Trace	None
Carbonate hardness	252	14	.....	.....	.....
Non-carbonate hardness	72	0	.....	.....	.....
Total hardness	324	14	0	0	0
Sulphates	80	68	76	928	0
Chlorides	3	2	1	32	0
Iron	Trace	None	None	None	None
Free carbon dioxide	11	.....	.....	.....	10
Bicarbonates	252	0	6	0	4
Carbonates	0	72	36	224	0
Hydrates	0	0	0	232	0
pH Value	7.7	10.1	9.3	11.7	5.9
Sulphate chloride ratio	26.7	34.0	76.0	29.0	.....
Sulphate carbonate ratio	.....	.....	.....	2.8	.....
Percent blowdown	.....	.....	.....	3.1	.....
Phosphate as PO_4 p.p.m.	.....	.....	12.0	70.0	.....



Panel board containing boiler instruments and controls.

This system consists of two sedimentation tanks and two filters. The first sedimentation tank or first stage of softening is provided with a jet heater for heating the make-up water to within two to five degrees of steam temperature, and directly below this the reagents of lime and soda ash are introduced, precipitating the hardness down to approximately one grain per gallon. The settled water from this tank flows by gravity to the second tank where it is deaerated by means of a jet deaerator, subsequently treated with phosphate where the remaining hardness is reduced to zero. This water is then filtered through two 8-ft. filters, using a bed of anthracite filtering material. The oily condensate is handled in a rather unique fashion in that it is introduced into the second sedimentation tank, heated by a jet heater in a compartment and this condensate joins the lime and soda effluent and is deaerated in the second stage. By this method of handling condensate and make-up, the primary softening and second stage softening, as well as the removal of oil from the condensate and deaeration of the entire feedwater, takes place in one continuously operated system, eliminating the necessity of installing separate individual equipment for this purpose.

The particular feature of this softener that is worthy of emphasis, is that the phosphate chemical is introduced into the sedimentation tank, where the precipitation of the remaining hardness from the first tank takes place instead of precipitating this in the boilers as is customarily done. This brings about a crystal water of zero hardness and



Above—Reducing valves and panel board. Below—New switchboard and circuit breakers in the turbine room.

reduces the sludge accumulation in the boiler to a minimum giving the best possible protection to the boiler.

Analyses showing the conditions at various stages in the water circuit are given in Table II.

The raw water available at this plant is extremely variable in its nature and constant attention to treatment is required to keep up with these changes. For this purpose hourly tests are made on the treated water and on the raw water so that the chemical changes can be anticipated as much as possible.

The average paper mill requires steam at about 160 lb. for existing engine drives, and at 40 lb. or lower for drying. If existing equipment is not to be considered, then the double extraction and condensing unit would apply, as was the case at the Container company's plant in Manayunk.

At Carthage, however, there was already in service a 1500-kw. bleeder condensing unit, bleeding at 10 lb., so that by adding a 1500-kw. back pressure top, operating from 550 lb. and 150 degrees to 160 lb., and interconnecting the governing mechanisms, there results the equivalent of a 3000-kw. double extraction and condensing unit.

The switchboard was completely remodeled. Each turbine is provided with remote control air circuit breakers. Lead covered conductors are carried in tunnels below to these breakers and a new overhead bus continues to the distribution breakers.

Every high pressure installation presents the problem of steam pressure reduction and desuperheating. The turbine does not at all times pass the entire output of the boiler, so that this equipment must be capable of reducing small quantities yet be adequate to reduce and desuperheat the entire requirements should the turbine fail. Two complete units were therefore provided with controls and two pen pressure and temperature recorders mounted on a convenient gauge board. An alarm is provided should the reduced steam temperature exceed a predetermined setting. Water for desuperheating is taken directly from the high pressure boiler feed system through a reducing valve.

University of Washington

(Continued from page 867)

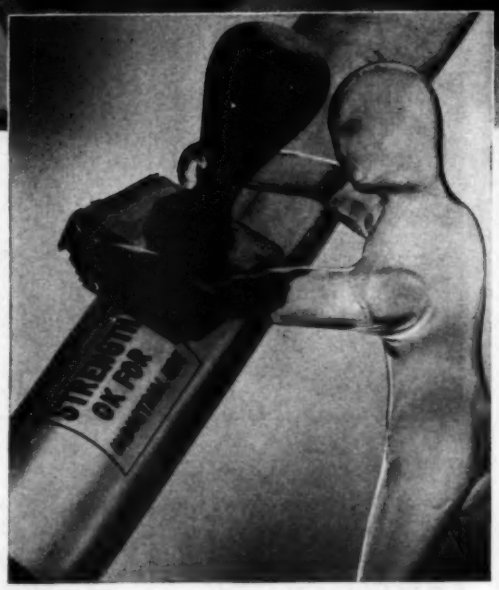
tion of the logging, lumbering and pulping industries in which the pulp mill would utilize the low grade logs, and lumber would relieve this situation and be beneficial to all three industries. To do this, a pulping process must be available for Douglas fir which will produce a high grade pulp of low bleachability. The kraft process as operated at the present time will not do this. Dr. L. C. Haffner and the writer made a complete investigation of the problem and developed a modified sodium sulphite process that produces a high grade, readily bleached pulp. The pulp is characterized by an extremely high tearing strength. A run of bleached Douglas fir shows: mullen 140, tear 220, G-E color 81.2. Not only can Douglas fir be pulped by this method to give a superior pulp, but other woods as western hemlock, southern pine, cottonwood and aspen have given excellent pulps. A suitable recovery process for the sodium and the sulphur has been worked out.

Such co-ordination of these three important industries will lower costs in all three, and reduce waste by converting it to a new variety of pulp. Such resarch will benefit all timber producing regions as all woods may be pulped by it.

PAPER SKETCHES

BECAUSE OF THE CASTE SYSTEM, MOHAMMEDANS, INSTEAD OF HINDUS, IT IS SAID, HAVE FABRICATED MOST OF THE HAND-MADE PAPER OF INDIA.
JAMES WATT, IN 1769, USED PAPER, PUTTY AND A FELT HAT AS STUFFING TO MAKE THE PISTON OF HIS STEAM ENGINE BETTER FIT ITS POORLY MACHINED CYLINDER.
THE GRANDFATHER-IN-LAW OF PATRICK HENRY, WILLIAM PARKS, ABOUT 1744, BUILT AND OPERATED AT WILLIAMSBURG, VIRGINIA, THE COLONY'S FIRST PAPER MILL.
THE FIRST COMMERCIAL USE OF CASEIN IN THE UNITED STATES IN THE COATING OF PAPER PROBABLY WAS MADE BETWEEN 1890 AND 1900.

YOU KNOW BECAUSE YOU SEE



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He won his title because when piping troubles occurred, he could nearly always put his finger on the source. His ability seemed uncanny but it was only blindfold guessing . . .

Now, since "Pyrex" Piping has been installed, you can see *exactly* what is occurring inside the "Pyrex" Piping. Definite knowledge has replaced blindfold uncertainty.

And not only is "Pyrex" Piping transparent, but it also has remarkable resistance to all acids and alkalies in solution (except concentrated HF). It can be flushed clean with steam or hot water. It is mechanically strong. It is genuinely economical.

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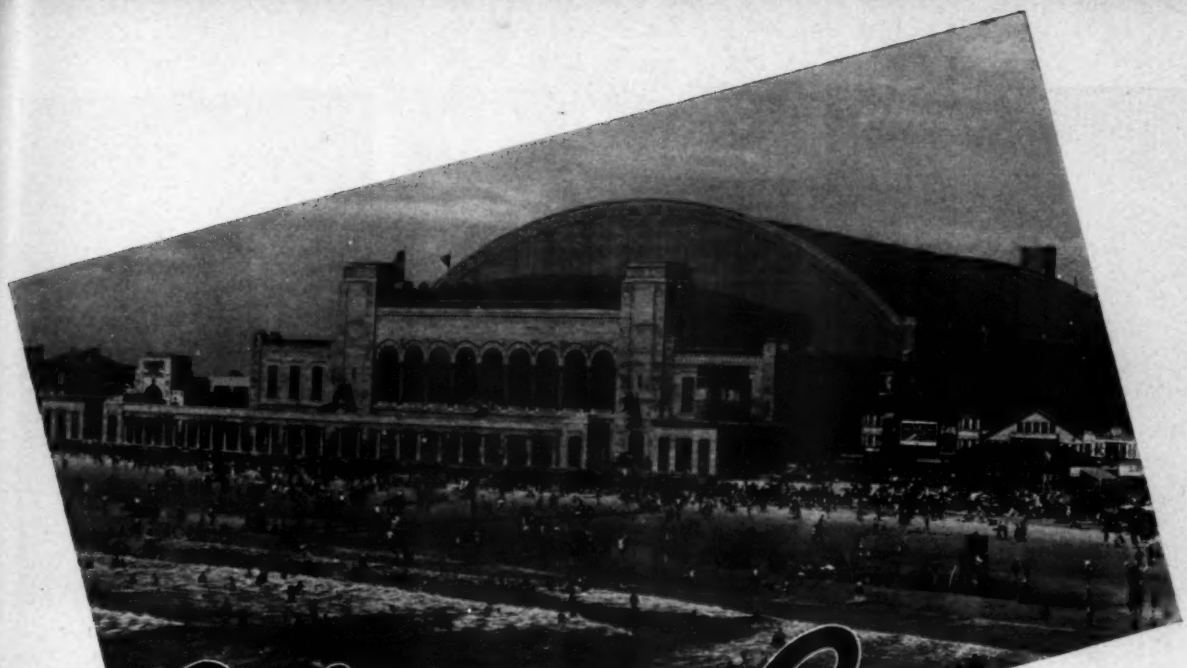


Atlantic City...

"World's Safest Playground"... Host to

SAFETY CONGRESS

▸▸▸ WAR HAS BEEN DECLARED. It is a fight to the finish. That old enemy, *Accident,* which in the past three years has taken the lives of more Americans than all the nation's wars, must be defeated.

Such was the theme of the Twenty-eighth National Safety Congress which met for five days beginning October 16 in Atlantic City, New Jersey, to wage its annual war against accidents. The Congress, which is the supreme war council of organized safety, has planned well for the coming year. More than 500 of its leaders revealed to thousands of safety representatives from every type of business and industry the latest methods and devices for the prevention of accidents and disease. Every phase of our national life . . . the home, highway traffic, and industry . . . was probed and analyzed with the thought in mind that safety must prevail.

To the casual observer, perhaps, there was nothing extraordinary about the convention. There was the usual bustle; the usual hurry and scurry, and the familiar badges pinned to coat lapels. But somehow . . . upon closer observation . . . this convention seemed to have little in common with the usual run of business conclaves. It was, on the whole, a convention which struck a fuller, more resounding note. The men and women attending the congress came to give, not to sell. They came to impart their knowledge, to give the benefit of their experience and to lend their time to promote but one thing—safety.

Atlantic City and the State of New Jersey itself turned out royally to aid and welcome the safety delegates.

Decorations for the Congress were placed in the hands of a special committee which arranged a beautiful colonnade on the plaza outside the massive auditorium, convention headquarters. The set-up was in the form of a Court of Honor featuring the National Safety Traffic Contest Awards. The entire court was landscaped with evergreen and flowers and at night the colored lights, for which Atlantic City is justly famous, played on the silver background.

Along the boardwalk, between Virginia and Morris avenues, each light standard was decorated with welcome shields in the Council's colors of green and white. Special decorations were placed at the railroad station and the whole city took on a gala attire to welcome the delegates. A welcoming letter was sent to the Council members by A. Harry Moore, governor of the State of New Jersey.

General Meeting of Members

The general meeting got under way promptly on the morning of October 16, with D. D. Fennell, president of the National Safety Council, presiding. Mr. Fennell introduced the first

Colonel John Stilwell, new president of the National Safety Council.

speaker, General E. C. Rose, vice president of the Public Service Corporation of New Jersey and General Chairman of the New Jersey National Safety Congress Committee.

General Rose, in welcoming the members of the National Safety Council, declared that the fact New Jersey won the 1938 National Traffic Safety Contest Award is evidence that the State, though facing one of the toughest traffic problems of any state in the Union, had met the challenge of cutting death and accident toll in a magnificent manner. He pointed out that the selection of Atlantic City this year for the 28th Congress was indeed a tribute to the State, whose capital, Trenton, also captured the award for cities of its population.

After General Rose had finished his address, Mr. Fennell responded to the former speaker and addressed the members, after which the minutes were read and new and unfinished business was disposed of. Following this activity, Mr. Fennell introduced the Honorable Leverett Saltonstall, Governor of the State of Massachusetts, who spoke on "Life, Liberty and Happiness on the Highway—the State's Obligations to Its Citizens."

The Massachusetts governor brought forth the point that he believed that the chief responsibility lies with the state and local governments in regard to highway accidents. He proposed that the states increase their efforts to make the better-lighted-with-more-visibility - highways, "safer, wider, straighter and less dangerous intersections." He declared that "safer roads" was a better slogan than "more roads." He also called for public support of law enforcement, asserting that public opinion is the great motive force behind the solution of any problem that vexes a democracy.

▶▶▶ The final speaker on the general meeting program was the Honorable Frances Perkins, Secretary of Labor.

Madame Perkins told the Congress that the fight for adequate workmen's compensation laws was "far from won," and that while most people take it for granted that the workers injured in industrial accidents are generally well protected by law, they are unaware that due to various exemptions and exceptions in state laws, more than half the workers in the country are entirely unprotected.

Madame Perkins praised employers for spending $25,000,000 a year for safety promotion in plants and urged them to elicit state aid by formulating codes of safety regulation and having the state governments enforce them.

Members Renew Pledge

Members of the National Safety Council renewed their vows against accidents and preventable disease at the general meeting. The entire body stood and in unison solemnly took this pledge:

"We, the members of the National Safety Council, assembled at this 28th National Safety Congress and Exposition, are convinced that substantial reductions in accidents in many fields serve as a challenge to bring about even greater savings.

"We are further convinced that these reductions will be achieved in almost exact proportion to the intensity and persistence of our efforts.

"And since we believe that safety begins at home, each of us hereby takes this pledge:

"I will obey all traffic signs, signals and regulations, whether driving or walking.

"I will endeavor at all times to keep myself and my car in a proper condition to drive safely.

"I will conscientiously support all worthwhile efforts, both public and private, to promote greater safety in the home, in the shop and office, in the school and on the street and highway.

"I will do everything I can to bring about greater safety in my work.

"I will seek to remove all hazards from my home and to exercise continuous care to prevent accidents there.

"I will strive constantly by personal example to inspire safe practices among those with whom I come in contact."

1939 Accident Trends

Based on figures submitted by city, state and national authorities for comparable periods in 1938 and 1939, the Statistical Bureau of the National Safety Council reports that the death total for all accidents from January to August was 60,840 . . . approximately the same as last year. Reduction in motor vehicle, occupational and public (not motor vehicle) deaths were offset by an increase in home accident fatalities.

D. D. Fennell, retiring president of the National Safety Council.

Under occupational accidents the report reveals that the death total for the first eight months was 10,800. This is 4 per cent down from last year. Lives saved were 400. There was a decrease in deaths despite increase in employment. Contests conducted by local safety councils and the National Safety Council shows 8 per cent reduction in frequency rate from last year.

New Officers Announced at Banquet

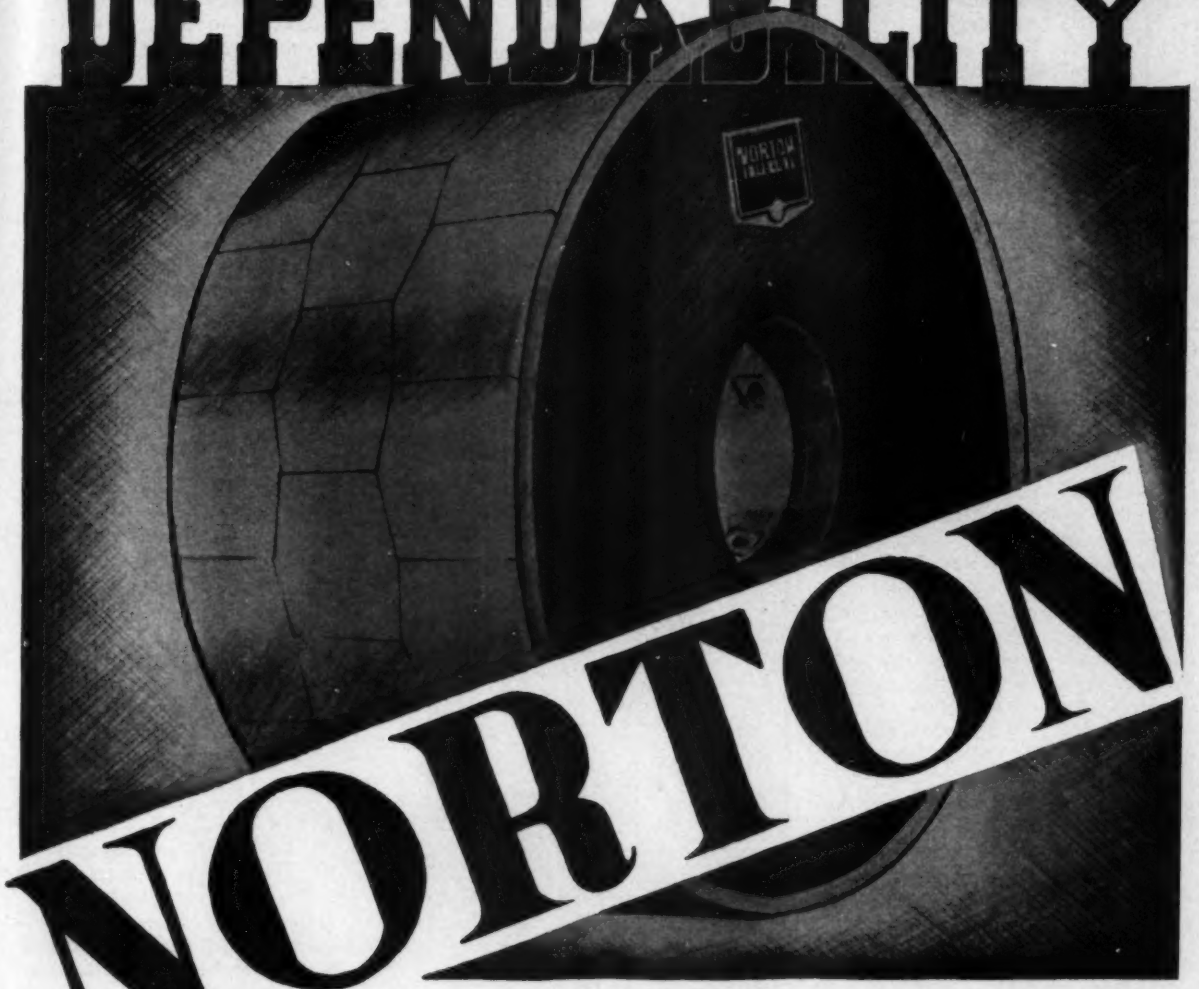
One thousand persons attended the Council's 28th annual banquet held October 28 in the auditorium ballroom and at which time officers for the coming year were announced.

The newly elected president of the National Safety Council is Colonel John Stilwell, vice president of the Consolidated Edison Company, New York City, who succeeds D. D. Fennell. He is a graduate of Yale and was formerly connected with the U. S. Army, he has been with his present concern since 1909. During the past two years he was president of Greater New York Safety Council.

W. H. Cameron, who has been managing director of the Council since its inception in 1913, was re-elected for another term.

Principal speakers at the banquet were former Governor Harold Hoffmann of New Jersey, now director of the New Jersey Unemployment Commission, and Edward C. Romfh, former mayor and prominent banker of Miami.

DEPENDABILITY



NORTON

The strength of construction of Norton Pulpstones to withstand high loads and temperatures meets the new production requirements.

NORTON COMPANY • Worcester, Massachusetts

NORTON ABRASIVES

A feature of the banquet was the presentation of the David S. Beyer award, the highest honor given by the National Safety Congress, for the best film of the year on safety. This award was presented this year to the Metro-Goldwyn-Mayer Studios for its picture "Drunken Driving." The huge trophy was accepted by Arthur A. Schmidt.

PAPER AND PULP SECTION

▶▶▶ Although some of the regular members of the Section were missing, the attendance was about the same as other years—121 names were on the registration list and many visitors from other sections and guests as well attended most of the sessions.

The spirit of goodfellowship which always prevails among those who attend these annual gatherings beamed a welcome to all those present, but the absence of three prominent leaders of the Section who had passed on since the last meeting was deeply felt.

D. B. Chant, secretary-engineer of the Ontario Pulp & Paper Makers' Safety Association, Toronto, opened the meetings of the Section as its Acting Chairman. At the Congress in Chicago last year, Mr. Chant was elected vice chairman, but with the passing of General Chairman Fred A. Robinson, on September 1, 1939, the responsibility of presiding at the meetings this year fell upon Mr. Chant. Even with the short length of time given him in which to prepare an address, he gave a very comprehensive and complete report on the progress and activities of the Section during the past year.

Opening his address, Mr. Chant spoke "In Memoriam" paying high tribute to the three men the Section had lost since it last met. He spoke of them as staunch supporters to the work of the Section and expressed the feeling of the entire gathering in saying that their contribution to the progress of the Section had been invaluable. A committee was appointed to draft resolutions as a tribute to the General Chairman, Fred A. Robinson, Past General Chairman, Walter Brennan, and Edward Benton Fritz, publisher of THE PAPER INDUSTRY AND PAPER WORLD. Mr. Fritz conceived the idea of a contest among mill members of the Section in 1925, and he had annually awarded the major trophy to the group winner who was judged as having the best safety record for the term of the contest.

(Resolutions drawn by the committee, and passed by the Section appear on Page 885).

Speaking of the membership of the Section, Mr. Chant reported that there had been a net gain of nine members during the past year, bringing the total membership up to 226.

Chairman Chant also spoke with deep appreciation for the work done by the officers, the various committees, and the *News Letter* editor, Russell Simpson. Mr. Simpson carried on his work in a most efficient manner even though handicapped part of the time by illness, for which reason he was unable to attend the meeting. In general, Chairman Chant spoke in part:

"This practical recognition of the value of the work of the National Safety Council, and of the Paper and Pulp Section in particular, demonstrates the mutuality of interest which runs all through our activities and should encourage and stimulate every one of us to do all in his power to promote the conservation of human life and the prevention of economic waste which always have been, are today and will ever remain, our primary objectives. We cannot all make equal contributions to this noble cause but there is no reason why any of us should fail to add something to the great and constantly growing total of jobs well done which is producing increasingly better results with each passing year.

D. B. Chant, who was elected general chairman of the Paper and Pulp Section.

"Above all we must guard against allowing the splendid progress already made to lull us into a false sense of security. We may take proper pride in what has been done in our individual plants, or in this Section as a whole, but we cannot afford to forget for an instant that complacency has ever been the implacable enemy of human progress. Like everything else in life, safety is never static. We must either continue to press forward to greater things or slip back into mediocrity or worse.

"It is my fervent hope that each of us may go home from this series of meetings with renewed determination to work just a little harder and a bit more consistently in the coming year to bring accidents under better control in the operations of the great industry which we represent.

"The officers you will elect tomorrow to guide the work of this Section for the next twelve months will be eager to give their best abilities in your service but only if they can have your full and willing cooperation will they be able to make their efforts as effective as they want them to be. On their behalf, I bespeak a continuation of the splendid support you have given during the term now ending and pledge to you for them the same sort of unselfish service you have received from the officers and committee-members of this Section in the past.

"This account of the way in which the work of the Paper and Pulp Section has been carried forward during the year would be seriously incomplete if it failed to make particular mention of the fine support received from the headquarters staff of the National Safety Council. Their wise advice, ready help and sympathetic attitude toward our problems have supplied constant encouragement and inspiration to the officers of the Section and are gratefully acknowledged.

"In the firm believe that together we can reach new heights of accomplishment in the future, in spite of disturbed conditions resulting from influences beyond our power to control and circumstances in whose creation we have had no part but which may, nevertheless, compel us to deal with new problems of national and individual importance, I look forward with confidence to the steady continued progress of the work of this Section, and in that spirit this report is submitted."

At the sessions Monday afternoon and Tuesday afternoon, seven papers were presented, each of which contained valuable information. Most of them were followed by interesting discussions. The authors were highly commended for the ideas put into these contributions and for the time given to their preparation. *(Digests of these papers and the discussions which followed them will be found in the section "Convention Papers . . . Abridged," in this issue and next month. Editor's Note.)*

TELLURIUM LEAD
STRENGTHENS WITH STRAIN

When a plant has an unusually tough assignment—a job with more than its fair share of hard knocks—Tellurium Lead gets elected.

The reason why is that this lead can take it. It develops increased toughness under stress. *It work-hardens.* When rolled, hammered or stretched, it actually becomes stronger. Therefore joints and turn-over points are less subject to cracking. Where vibration is excessive—or heat changes frequent and rapid—this capacity to develop latent strength enables Tellurium Lead to render longer service.

Another important advantage of Tellurium Lead is this: It gives increased resistance to sulphuric and other corrosive acids at high temperatures. In plant after plant, it has prolonged the useful life of equipment...and reduced the number of shut-downs for repairs.

Tellurium Lead of our manufacture is time-tested St. Joe chemical lead alloyed with a small quantity of tellurium. It gives the advantages of this well-known chemical lead, plus important new ones. Yet it costs only a fraction of a cent more per pound than chemical lead. Available in sheets, pipe and coils. For further facts, write nearest branch.

Typical User Reports

"I wish to say that your Tellurium Lead pipe has proved all you claimed. It is easy to weld and easy to flange. Also the flanges stand up a good deal better than ordinary lead as they seem to actually become stronger at the turn-over point."

Another user writes: "For the last two years, we have purchased all our lead requirements in Tellurium Lead, since we find a considerable advantage in its stiffness and resistance to vibration crystallization. This lead has been used for tank linings, pipe lines and various acid plant fittings. We feel that it is well worth its additional cost."

NATIONAL LEAD COMPANY

New York, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, St. Louis; National-Boston Lead Co., Boston; John T. Lewis & Bros. Co., Philadelphia; National Lead & Oil Co., Pittsburgh; Georgia Lead Works, Atlanta; American Lead Corp., Indianapolis; Master Metals, Inc., Cleveland; The Canada Metal Co., Toronto, Montreal, Winnipeg, Vancouver.

New Officers Elected

The list of new officers prepared by the Nominating Committee was read at the Tuesday afternoon session by A. Scott Dowd, chairman of the committee. The report was unanimously accepted by the Section. The new officers thus elected to serve for the year 1940 are as follows:

General Chairman—D. B. Chant, Ontario Pulp & Paper Makers' Safety Association, Toronto, Ontario.

Vice Chairman in Charge of Membership—Clayton O. Braatz, Marathon Paper Mills Company, Rothschild, Wisconsin.

Secretary and Program Committee Chairman—C. O. Holmer, Minnesota and Ontario Paper Company, Minneapolis, Minnesota.

News Letter Editor — D. A. McAlary.

Following are the names of committee chairmen who will serve for the coming year:

Contest Committee—A. Scott Dowd, THE PAPER INDUSTRY AND PAPER WORLD, Chicago.

Data Sheet Committee — R. G. McGivney, Oswego Falls Corporation, Fulton, New York.

Engineering — Safe Practice Committee — Arthur Murray, Container Corporation of America, Chicago.

Health Committee— Dr. Louis H. Frechtling, Champion Paper and Fibre Company, Hamilton, Ohio.

Statistics Committee — Fred W. Braun, Employers Mutuals, Wausau, Wisconsin.

Publicity Committee — Walter E. Strong, Menasha Products Division of Marathon Paper Mills Company, Menasha, Wisconsin.

Safety Instruction Card Committee —R. W. Croucher, Minnesota and Ontario Paper Company, International Falls, Wisconsin.

Visual Education Committee — Julius A. Draper, Consolidated Paper Corporation, Ltd., Montreal, Canada.

LUNCHEON MEETING

Those who attend the meetings of the Paper and Pulp Section always look forward to the luncheon meeting. It is the crowning event on the Section's program. It is also an occasion which brings recognition of the best safety records for the year. The introduction to the roll call of merit is the report of the Contest Committee chairman. As soon as the guests had enjoyed the very appetizing luncheon that was served, Chairman Chant called upon A. Scott Dowd, chairman of the Contest Committee for data on the contest. Mr. Dowd submitted the following report:

Data on the 1938-1939 Paper Industry Contest

There was an enrollment of 163 mills and manufacturing units in the Thirteenth Paper Industry Annual Safety Contest, and 159 of these qualified for final rankings, as tabulated in the final report now placed in your hands. 64,178 employees were engaged in the Contest, whose working time amounted to 133,034,656 man-hours.

C. R. Dooley, Socony-Vacuum Oil Co., Inc., who spoke on how job analysis and merit rating systems solve accident prevention problems.

The popularity of these contests is shown in the steady increase of participating units each year since 1932. The 1938-39 Contest was the 8th competition in succession, each covering periods of 12 months. A review of these and the preceding 6 months' competitions shows great progress has been made in the prevention of accidents in the paper and pulp industry. The number of disabling injuries per million man-hours worked was the lowest of any previous period, and 18 per cent lower than the average rate for the preceding 7 years. One out of each 38 employees engaged in the Contest had a disabling injury, the best record thus made since 1932.

Comparing this record with that of the 244 organizations which reported to the National Safety Council their 1938 paper and pulp experience, we find that the Contest frequency rate of 12.816 was sixteen per cent lower, and this helped to bring the injury rates in the entire industry to a new low level since 1926, making the improvement in frequency 72 per cent, and in severity 69 per cent, during the past 12 years.

Perfect scores were made by 12 contestants, of which the Container Company, Van Wert, Ohio, in Division II, worked the largest number of man-hours—303,056.

Group A made the greatest improvement in frequency over the 1937-

At the Monday afternoon sessions, W. E. Strong, Marathon Paper Mills Co. (Menasha) gave an interesting paper on "Back Injuries." Mr. Strong (left) confers with R. W. Croucher, Minnesota & Ontario Paper Co., who led the discussion following his address.

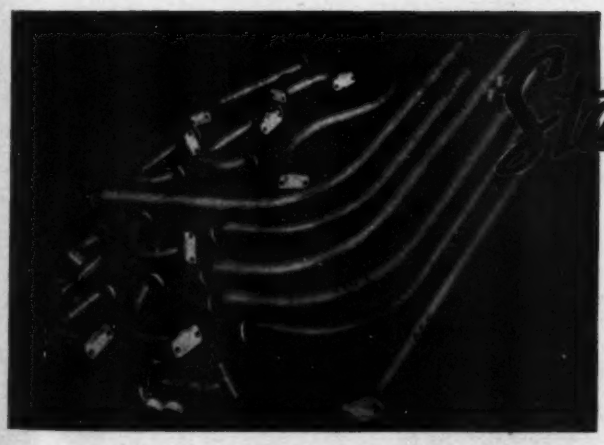
PITTSBURGH PIPING CAN MEET
Your Piping Requirements to the Letter

Carbon Moly Steel Piping

Since the increase in steam pressures and temperatures made the use of low alloy steels necessary, Pittsburgh Piping has fabricated and erected this type of piping for many of the country's foremost power systems. Because Carbon Molybdenum and other low alloy steels require extra care in fabrication, Pittsburgh Piping has developed a special technique for the highly efficient working of this type of material. This special technique extends to all operations in field erection as well.

Carbon Steel Piping

In its five acre plant, Pittsburgh Piping has complete facilities for pre-fabricating large sub-assemblies for every conceivable power and process requirement. Modern erection equipment and field welding methods used by specially trained crews assure speedy and efficient erection without interfering with other sub-contractors on the job.



Stainless Steel Piping

Since 1933, the Alloy Division of Pittsburgh Piping has been fabricating stainless piping and vessels for process industries. Because of the many metallurgical characteristics peculiar to stainless steel alone, Pittsburgh Piping has experienced fabricators that work only on stainless. The relative high cost of raw materials makes it more imperative than ever to have this type of fabrication done by stainless specialists at Pittsburgh Piping.

PITTSBURGH PIPING & EQUIPMENT CO., 10 FORTY-THIRD ST., PITTSBURGH, PA.

Woolworth Bldg. New York | Occidental Bldg. Indianapolis | Peoples Gas Bldg. Chicago | General Motors Bldg. Detroit | Public Sq. Bldg. Cleveland | 10 High St. Boston | 1st. Nat'l. Bank Bldg. Charlotte | 525 Market St. San Francisco

Pittsburgh Piping

38 competition—a reduction of 19 per cent. Group B achieved the lowest frequency rate, averaging 9.914.

Notable records have been made by all of the contestants in Ranks 1, 2, and 3 of each group, and there was a general trend of improvement over the previous records of many mills that had been in the Contest for a number of years. These individual accomplishments of progress are the things which make this sort of competition valuable to those that are engaged in it—a continuous, persistent effort on the part of each mill to improve its own past experience.

The rules governing our Annual Contest have been changed gradually each year to the point where they now invite participation of the greatest number of contestants. 187 units are enrolled in the 1939-40 Contest. This includes 24 new units.

You are familiar with the slight changes that have been made in the rules for the 1939-40 Contest. Rule 12 now requires that confidential reports of accidents shall be submitted to the National Safety Council. These will be used in research to determine circumstances and causes of accidents. Rule 15 has been revised to provide that when all registrations are received and the files closed, each contestant will receive a complete list of the coded numbers and names of each contestant, so that all units—excepting those requesting name deletion—can be properly identified. This is designed to make the Contest more useful as a competitive undertaking.

Contest Winners

The final rankings of all contestants in the Paper Industry Annual Contest, July 1, 1938 to June 30, 1939, were published in the September issue of THE PAPER INDUSTRY AND PAPER WORLD. According to their rank, the mills listed as No. 1 received trophy awards; those numbered 2 and 3 received certificates of merit. A list of the trophy winners is again given:

H. P. Houbner (left), the Flintkote Co., compliments F. J. Pavlis, of his company, who gave a stirring and refreshing talk at the Tuesday afternoon session. Mr. Pavlis gives his hand and commends Wm. E. Hornbeck (right), of Kimberly-Clark Corp. (Appleton), who also gave a most interesting address at the same session.

DIVISION ONE

Group A

Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec, Canada.

Group B

St. Croix Paper Co., Woodland, Me.

Group C

Hoberg Paper Mills, Inc. (Fiber Div.), Green Bay, Wis.

Group D

Spaulding Fibre Co., Inc., Milton, N. H.

United States Gypsum Co., No. Kansas City, Mo.

American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.

Hollingsworth & Whitney Co. (Aroostook & Cobbossee), Gardiner, Me.

Central Fibre Products Co., Vincennes, Ind.

The Mead Corp., Nashville, Tenn.

Central Fibre Products Co., Mt. Carmel, Ill.

Hollingsworth & Whitney Co. (Abenaquis), Madison, Me.

Spaulding Fibre Co., Inc. (Hayes Plant), North Rochester, N. H.

DIVISION TWO

The Container Co., Van Wert, Ohio.

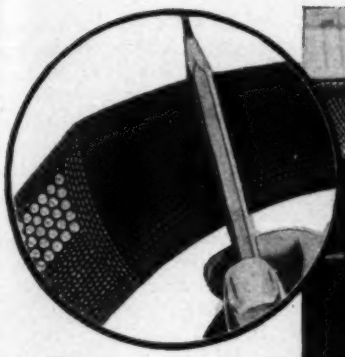
Gaylord Container Corp., Dallas, Texas.

Bay West Paper Co., Green Bay, Wis.

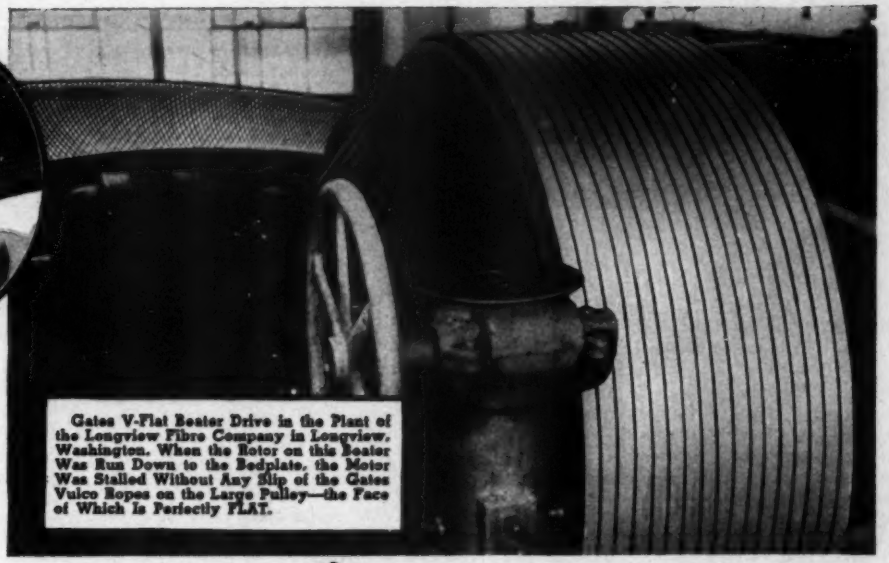
HISTORICAL REVIEW OF THE PAPER INDUSTRY SAFETY CONTEST

Year	No. of Mills	No. of Man-hours	No. of Employees	No. of Disabling Injuries	Frequency Rate	No. of Employees per Injury	Mills with Perfect Records
1938-1939	163	133,034,656	64,178	1,705	12.816	38	12
1937-1938	145	116,896,797	53,622	1,603	13.713	33	7
1936-1937	139	123,611,911	56,470	2,015	16.301	28	7
1935-1936	130	100,491,110	45,915	1,517	15.096	30	14
1934-1935	110	86,867,184	42,378	1,439	16.566	29	12
1933-1934	105	71,436,322	34,132	1,402	19.626	24	6
1932-1933	98	60,772,518	34,709	829	13.641	42	11
1931-1932	131	74,569,954	32,454	1,044	14.000	33	9
1931*	125	48,715,543	39,796	787	15.744	52	15
1930*	124	47,343,549	36,153	986	20.826	37	11
1929*	123	49,776,515	36,916	1,311	26.337	27	6
1928*	122	47,673,816	36,357	1,355	28.422	27	8
1927*	119	43,802,804	33,786	1,468	33.514	23	6

*Contest period January 1, to June 30.



The **Concave Side** IS A GATES PATENT



Gates V-Flat Beater Drive in the Plant of the Longview Fibre Company in Longview, Washington. When the Rotor on this Beater Was Run Down to the Bedplate, the Motor Was Stalled Without Any Slip of the Gates Vulco Ropes on the Large Pulley—the Face of Which Is Perfectly FLAT.

Prove this *Yourself!*

Grip a Bending V-Belt With Your Fingers and Learn *WHY* the Concave Side Makes

A BIG SAVING in Belts and Power

What Happens When a V-Belt Bends

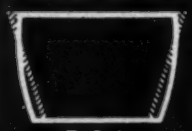


FIG. 1

FIG. 2

If you want longer belt wear and better transmission of power, make this simple test:

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sidewalls between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1 on the left. Clearly, that out-bulge gives the belt a shape that does not fit its sheave groove.

Now look at figure 2. There you see what happens when you bend a belt that is built with the patented *concave* side. You get a similar change in sidewall shape — but what a *different result!* The precisely engineered concave side becomes perfectly *straight*. This belt, when bent, exactly fits its sheave groove —and two big savings result.

First:—With no out-bulge of the sides, the *full width* of the belt *uniformly* grips the sheave groove wall. This means *uniform* wear—*longer life*. Second:—The full side-width grip on the pulley carries heavier loads without slippage. This saves belt wear—and it saves a lot of power, too!

The Gates Vulco Rope is the Only V-belt built with the patented concave side.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL., 1524 South Western Ave. HOBOKEN, N. J., Terminal Building BIRMINGHAM, ALA., 1631 1st Ave., S. LOS ANGELES, CAL., 741 Warehouse St.

DENVER, COLO., 999 South Broadway DALLAS, TEX., 2213 Griffin Street PORTLAND, ORE., 1231 N. W. Hoyt St. SAN FRANCISCO, CAL., 2700 16th St.

Presentation of Trophies

After Mr. Dowd's report had been presented, Chairman Chant commented on the improvement revealed in the data, particularly in the frequency and severity rates. The contests have proved to be a valuable part of the campaign against accidents.

The Group trophies which are always awarded by a representative of the National Safety Council received next attention as the Chairman introduced Lewis DeBlois, executive vice president of the Greater New York Safety Council, New York City, and a past president of the National Safety Council. Mr. DeBlois presented the trophies which are awarded each year by the National Safety Council, and made a few very interesting comments on the work being done by the Section. He referred to the contest in the Paper and Pulp Section as one of the oldest in the Council and congratulated all participants on their accomplishments.

Although the group winners are usually recognized from their published record, the mill which the judges decide as the outstanding group winner of the year is never known until the time arrives for the presentation of what has been known as the Paper Industry trophy.

A Memorial

At this point in the program, Chairman Chant turned to A. Scott Dowd, vice president and general manager of Fritz Publications, Inc., to make this presentation. Mr. Dowd prefaced his remarks with a tribute to the Section's leaders who had been taken away during the past year—the loss of Fred Robinson and Walter Brennan. The pioneer work of Edward B. Fritz, who has awarded the major trophy in the contests for a number of years, was already known to most of those present, and Mr. Dowd referred to "Dad" Fritz's presentation of the trophy at the Congress in Chicago last year as his last official public appearance. Although not in attendance this year, his work is being carried on, and Mr. Dowd introduced to the Section, Mrs. Fritz, who is now treasurer of the business which since Mr. Fritz's passing has become Fritz Publications, Inc. The trophy which Mrs. Fritz graciously presented with a few impressive remarks "for Dad," bore the inscription of the winning mill—the group winner in Group A—"Anglo-Canadian Pulp & Paper Mills, Ltd., Quebec City, P. Q., Canada." E. N. Baronet, representative or the Anglo-Canadian Company, received the trophy from Mrs. Fritz with a feeling of surprise, pleasure, and solemn memories, for last year he received from Mr. Fritz the trophy awarded in the previous contest, and was photographed with the donor at that time. (Cf. page 862, THE PAPER INDUSTRY AND PAPER WORLD, Nov. 1938.) Although the award instituted by Mr. Fritz remains unchanged, there was surprise and great feeling expressed when the trophy was displayed. For it has become the Edward Benton Fritz Memorial Trophy and bears a familiar likeness of Mr. Fritz in bronze. (See illustration.)

Chairman Chant voiced the thanks of the entire Section and expressed to Mrs. Fritz appreciation for the award.

Representatives of companies winning National Safety Council group trophies and the Edward Benton Fritz Memorial Trophy and those making the presentations. (Left to right) Front row—J. R. Latter, Anglo-Canadian Pulp and Paper Mills, Ltd.; Mrs. A. C. L. Fritz, treasurer Fritz Publications, Inc.; E. W. Baronet, Anglo-Canadian Pulp and Paper Mills, Ltd.; Harry L. Hayes, St. Croix Paper Co.; Robert Mutch, American Writing Paper Corporation. Middle Row—John C. Lavin, St. Croix Paper Co.; Alfred Brill, Hollingsworth & Whitney Co.; Lewis A. DeBlois, past president National Safety Council; A. Scott Dowd, vice president and general manager Fritz Publications, Inc., and chairman of Contest Committee; Noel A. Pease, The Container Co., Van Wert, Ohio. Back row—Julius A. Draper, Consolidated Paper Corp., Ltd.; George E. Kent, St. Croix Paper Co.; Ernest Augustus, The Mead Corp.; B. J. McCloskey, Hoberg Paper Mills; G. L. Hann, U. S. Gypsum Co. (Phila.); A. M. Koury, Champion Paper & Fibre Co., Houston, Texas.

Resolutions PASSED BY PAPER AND PULP SECTION

▶▶▶ With deep sorrow the members of the Paper and Pulp Section of the National Safety Council record the death of its General Chairman, Fred A. Robinson, on Thursday, August 31, 1939, and extend to Mrs. Robinson and the other members of his family our heartfelt sympathy.

Fred had been active in the work of this organization for many years. His broad experience, good judgment and wise counsel have proved of inestimable value to the Section and his fine personality and sincerity of purpose won the respect and friendship of all with whom he was brought into contact.

Mindful of our long association with Fred as an officer and member of this body, and of his constructive work on our behalf, we wish to pay sincere tribute to his memory. Be it therefore

Resolved, That we, on behalf of the membership of the Paper and Pulp Section of the National Safety Council, attest to the inspiration and support which Mr. Robinson brought to the deliberations of this Section and the committees upon which he faithfully served; and be it further

Resolved, That a copy of this resolution be spread upon the minutes of this organization, and that a copy be sent to his family as a testimonial of our appreciation of his unfailing willingness to apply his manifold abilities in the service of his fellowmen.

(Read by F. H. Rosebush, Nekoosa Edwards Paper Co., Port Edwards, Wis.)

▶▶▶ This section learns with deep regret of the death of Walter J. Brennan, of the Associated Industries of Maine, October 4, 1939.

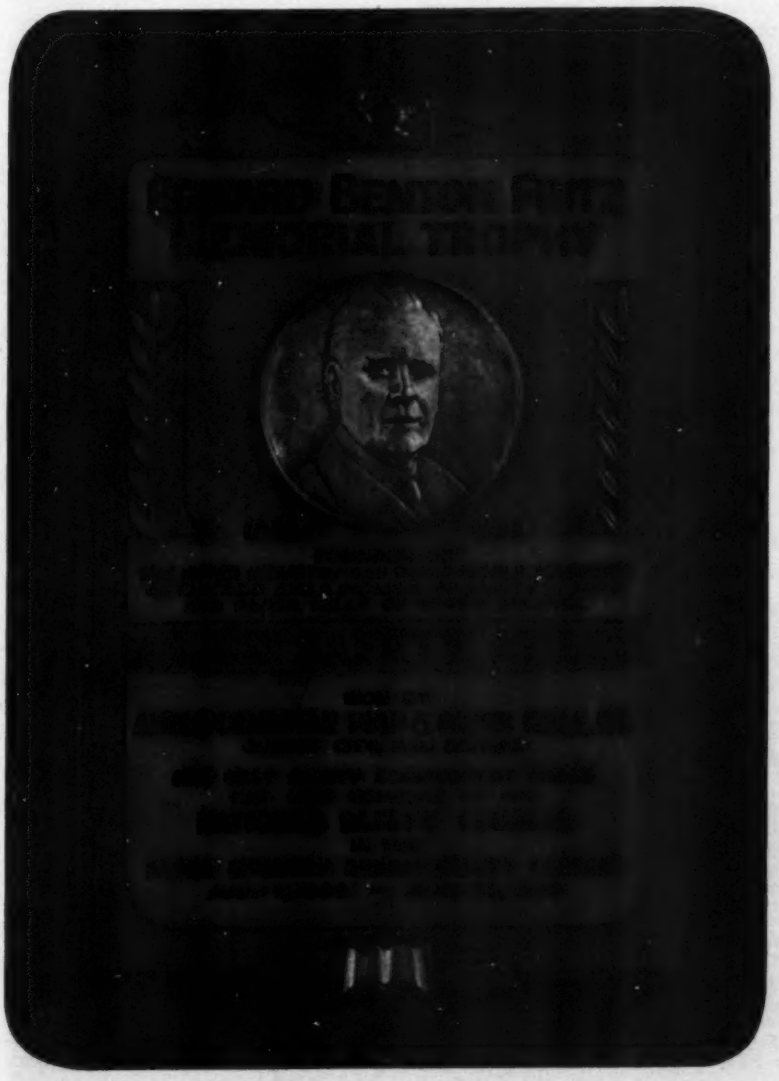
"Walt," or "Bill," as many of us knew him, was General Chairman of the Section back in 1930 and 1931, and for a number of years was very active in the work of the Section.

Because of ill health and because he has not been directly connected with the paper industry, members of the Section had heard little from Bill Brennan the past year or so. Despite his absence, however, the work that he did during his years of activity with the Section is still remembered. As an officer and member of the Section, he contributed much. As a friend, he was respected and admired by all. We extend our sympathies to members of his family and do pay this tribute to the memory of Bill Brennan. Be it therefore

Resolved, That we, on behalf of the membership of the Paper and Pulp Section of the National Safety Council, attest to the inspiration and support which Walter Brennan brought to the members of this Section which he so faithfully served; and be it further

Resolved, That a copy of this resolution be spread upon the minutes of this organization, and that a copy be sent to his family as a testimonial of our appreciation of his unfailing willingness to apply his manifold abilities in the service of his fellowmen.

(Read by Walter Gleason, Safety Director Hammermill Paper Company, Erie Pennsylvania.)



▶▶▶ In the passing of Edward B. Fritz, publisher of the Paper Industry and Paper World, Chicago, Illinois, we, the members of the Paper and Pulp Section of the National Safety Council have lost a sincere friend and zealous supporter of our activities and interests.

"Dad" Fritz, as he was so affectionately known to many members of this Section, truly had the prevention of injuries to workers in paper and pulp mills close to his heart. For many years, he was the donor of awards and trophies to winners of safety contests in which the various divisions of this Section participated. Members of his company also contributed largely of their efforts and time in carrying on the work of keeping the records as they were achieved in these yearly contests. We remember him at many of our past sessions, and the personal pride he took in congratulating representatives of the mill awarded the trophy for meritorious accomplishment. His inspirtaion and enthusiasm encouraged many of us to redouble our efforts in the humanitarian task of preventing injury to fellow workers in our industry. Be it therefore

Resolved, That we, on behalf of the membership of the Paper and Pulp Section of the National Safety Council, attest to the inspiration and support which Mr. Fritz brought to the deliberations of our Section which he so faithfully served; and be it further

Resolved, That this resolution be spread upon the minutes of this organization, and that a copy of it be sent to Mr. Fritz's family as a testimonial of our sincere appreciation of his kindly interest and support.

(Read by George J. Adams, International Paper Company, New York, N. Y.)

PAPER & PULP SAFETY

"Information, Please"

▸▸▸ UNIQUE AND MODERN in its presentation, yet familiar and informal, was the open forum Paper and Pulp Safety "Information, Please," which engaged those present for the entire time allotted to the Thursday afternoon session. Members of the Section had submitted a number of questions, and before announcing any of these queries, Chairman Chant introduced the four participants who had been chosen as the panel for this interesting session. *(G. W. Phillips, The Champion Paper & Fibre Company, Canton, North Carolina, had been listed on the program but was not present.)*

Participants—Walter Gleason, safety director, Hammermill Paper Company, Erie, Pennsylvania; J. W. Kuebler, safety chairman, Dixie Vortex Company, Easton, Pennsylvania; B. J. McCloskey, director of public relations, Hoberg Paper Mills, Green Bay, Wisconsin; and Roland Richardson, manager Personnel Department, Gardner-Richardson Company, Lockland, Ohio.

Question—Should awards be made for safety suggestions?

Answers—One member stated that he did not believe that it was a general safety practice to make awards for safety suggestions. He pointed out that it is difficult sometimes to differentiate between a safety suggestion and a maintenance suggestion.

Another member stated that his experience had been just the opposite from that of the foregoing speaker. He said that the company had received many worth-while suggestions and that monetary awards were made for safety suggestions.

Still another member explained that in his mill they used a merit and demerit system. At the end of each month, he explained, a notice is put on the bulletin board showing the names of employees who have received merit marks and the number of employees who have received demerit marks. Merit marks were given for safety suggestions.

Question—Has any paper mill made scientific survey of proper lighting?

Answer—One member said that his company's engineering department made such a survey and found lighting conditions bad and that even with clean reflectors it was not considerably improved. He stated that a new lighting system was very beneficial but that the bulbs and reflectors must be kept clean.

The chairman recommended a pamphlet on industrial lighting and pointed out that the pamphlet contained a table showing the effect on general lighting if bulbs and reflectors are cleaned.

One member stated that his company installed fluorescent lighting for the sorting tables and discovered that better lighting resulted and also better performance by the workers. It stressed that the lighting was not hard on the eyes and does not give the glare that other lighting does.

Question—How can you handle or deal with the foreman who maintains that accidents are bound to occur?

Answers—One delegate stated that he recommended selling the foreman that it is part of his duty to maintain safety.

The chairman stated that it is part of the duty of the foremen to take an interest in accident prevention and not to maintain the attitude that accidents are bound to occur.

Another delegate said that if the foreman shows a lack of interest in safety it reflects the attitude of the top management and that there was no excuse in this day and age for any link in the supervisory chain to take that attitude.

The chairman then brought up the point that foreman's training courses are available and have been used successfully in the paper industry. The proper course in foremen's training should overcome this wrong attitude.

Question—Do any companies make any effort to standardize clothing or to furnish gloves to mechanics or particularly encourage their use?

Answers—A member explained that his company makes sanitary products and has three hundred girls working in the department. The company furnishes uniforms to the girls and takes care of the laundering also. In the manufacturing department every man has to wear a white shirt and white pants. He also stated that the company is very strict about personal hygiene.

Another delegate stated that his company furnished clothing in any unusual occupation around the mill, such as gloves for the chipper man, etc.

The chairman pointed out that he knew a number of wood mills where oilskins and waterproof clothing is supplied by the employer where men have to pick the stuff out of the canals where the wood is floated to the point of delivery.

Question—Is there any better way of cutting paper off than by means of an axe?

Answers — One member explained that his company had a method called the skinner's stick. The men on the paper machines have a short hardwood stick about a foot long, which does a very efficient job of skinning.

Another delegate stated that his company produces heavier grades of paper and that the stick sometimes resulted in bruised hands. He stated that they now use a short, old-fashioned hook or straw hook. The point is not too sharp. He stated that the hook was a little more successful than the stick.

Discussion — There were several comments made by members as to the practicability of using a small, electric saw for cutting paper off. One mem-

These men led the forum on Paper & Pulp "Information, Please." (Left to right) D. B. Chant, Ontario Pulp & Paper Makers' Safety Ass'n, and general chairman of the Paper and Pulp Section; J. W. Kuebke, Dixie-Vortex Co. (Easton, Pa.); Roland W. Richardson, Gardner-Richardson Co. (Lockland, O.); Walter A. Gleason, Hammermill Paper Co.; B. J. McCloskey, Hoberg Paper Mills.

"Kindly step out of my soup"

...SAID THE DUCHESS ON PAGE 21 TO THE CANNIBAL ON PAGE 22

"MADAM," the Cannibal replied, "do you think I enjoy being someone else's meal. Besides, I belong with a circus on the next page."

"Oh, I take it you're just *show through*," the Duchess raised her lorgnette for a closer look. "I'll *certainly* write a strong letter to the manufacturer of this paper."

"About using Krebs Pigments?"

"About keeping cannibals out of my soup."

"Please," said the Cannibal, kicking a mushroom from under one foot, "Krebs Pigments would have saved us both this discomfort. They give opacity to even the thinnest paper."

"Your manners are all right," the Duchess sniffed, "but are your feet clean?"

"That's another thing about Krebs Pigments," the Cannibal went on. "They're clean. You ought to see how white and bright they make paper . . . printing sharp and easy to read on both sides. The Krebs people will be glad to show how easy this is and give all the technical information your paper manufacturer needs."

"Young man, I don't want to be nasty," the Duchess cooed, "but will these pigments put you back in your place?"

"Yes, thank goodness," the Cannibal sighed. "You just *write*."

KREBS PIGMENT & COLOR CORP.

1007 Orange Street, Wilmington, Delaware

ber pointed out that it would be difficult to keep the saw sharp and another member stated that friction would take the temper out of the blade. This same member then asked if anyone used an axe to chop off the cores.

This latter question was answered by one member who stated that in his company they fed the kraft to the rolls over the beater but that they had developed something out of a piece of timber so that the operator kept the speed of the roll down while it was unwinding into the beater.

Another member added to the latter explanation by stating that his company has such an apparatus which takes six rolls and feeds them right in. This would be a six roll unwinding stand on a truck with a pair of driven rolls to unwind the paper.

Question—What procedure may be followed in inspecting mechanics' tools, referring to the safety inspection of tools owned by the individual mechanic, not company tools used by them?

Answers—One member stated that his company suggests that the man replace a tool that is faulty and that is all the action necessary.

Another member stated that his company repairs tools that are broken —if beyond repair the mechanic must buy a new tool.

Question—Has a satisfactory means of prevention been found for picaroon or wood hook injury to feet or legs?

Answers—The chairman stated that to his knowledge there is no means of protection yet developed, other than the use of some sort of protective clothing. Inspection of the instrument is one precaution. The chairman made reference to a new piece of protective clothing, a shin guard, which is made of chain or link mesh, which passed laboratory tests satisfactorily.

Another member stated that he learned that the Anglo-Canadian Company had developed a wonderful hook and that they are equipping all their men with it.

Question—Should goggles be worn by wood room employees?

Answers—The chairman stated that it was fairly general practice in the woods rooms with which he was familiar, for the men to wear goggles on certain jobs, including men working on the knife barker, wood boring machine and wood peckers. He also added that the celluloid mask is found to be satisfactory because of the fact that they are lighter and there is more ventilation under them.

Another member stated that chippers do not like to wear goggles because they get dirty and muddy and cannot see. He stated the men in his company are wearing face shields.

One member stated that one of his men was struck in the eye with a sharp chip on the disc knife barker and lost the sight of an eye, hence he was interested in the extent to which goggles are used.

Discussion — Discussion then followed regarding the hazard of flying chips, one member pointing out that a manufacturer recommended a twelve-knife disc. It was stated the hazard can be aided if the charging floor is raised or the chipper lowered.

One member stated that his company lowered the chippers to the mezzanine floor. He said they had a ten foot spout and where they formerly had a chipper man and helper, both wearing goggles, they now have one man feeding the chipper, alone and without goggles. The main feature, he stated, was to keep the spout full and the wood coming fast enough.

Question—What kind of physical examination should be taken on both pre-employment and re-examination after employment in order to have some prior knowledge from the point of view of safeguarding against injuries and cases of lame back, etc.?

Answers—One member, a doctor, stated that any examination should be thorough and that he did not know whether it was possible, without an X-ray, to find out the condition of the spine.

The member also added that he knew of a company which decided to give all of its employees an examination to discover whether they showed signs of silicosis. At the same time they gave the group an opportunity to have the Wassermann test. The member stated the company didn't get to first base in doing that but over a period of 14 months they sold the idea to the employees.

Question—Why should more hand injuries occur among men of long experience in a department than among newer employees?

Answers—One member stated that it was a matter of familiarity breeding contempt. Another member added that it might be a case of the supervisory force paying too little attention to working habits.

Question—Has anyone found in spite of the standard use of eye protection for men who are arc welders and lead burners in the paper mills, that there is damage done to a man who has been employed on that work for a period of ten, twelve or fifteen years? Does a man suffer some impairment to his vision as a result of this work which might, after a period of time of about that length, so reduce his eyesight as to bring him below your employment standards from that point of view, making him unfit for employment according to your standards?

Answers—One member stated that he did not know anything about this specific point but cited a parallel experience regarding ears. He stated that his company has a high speed suctional machine which makes a terrific roar. Men operating the machine noticed the roar outside work. It was found out that this roaring noise in the ear was temporary and after a man left the job for a length of time it left his ears.

Another member stated that in his company the welders, none of whom are full-time welders, did not suffer any detriment.

One delegate stated that a passerby will stop to watch welding and will injure his eyes temporarily. It was pointed out by one member that it is a breach of safety rules to watch a welder.

Another delegate stated that through constant plugging of safety rules his company had trained employees not to look at the welding arc.

Discussion—The chairman of the session then brought up the important point of woods operations, pointing out that the frequency of accidents in woods operations is approximately four times what it is in the mill in his company. He asserted that it seemed to him that the National Safety Council seems to lack an active service for woods operators.

The chairman stated that if there are enough members interested in woods operations who would like to stir up a little activity along that line in the National Safety Council so that there would be a little more service to those in that end, he would like to have them write him so that he could undertake to see if something couldn't be done.

One delegate then brought up the point of off-the-job accidents and suggested that something should be done to educate the workers as to this phase of safety. The chairman of the section agreed with the delegate and cited an instance in his own company which cost a lot of money when five employees were injured while driving.

Following this discussion Chairman Chant thanked the attending members for their participation in the meetings and stated that he hoped to see them all next year at Chicago. The section then gave a rising vote of thanks to Mr. Chant and the meeting was adjourned.

ADVERTISING PAGES REMOVED

The Paper Industry Safety Contest

July 1, 1939 to June 30, 1940

Out of 182 mills reporting for September, 48 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
Price Brothers & Co., Ltd.	Kenogami, P. Q.	Canada
Oswego Falls Corporation	Fulton	New York
The Gardner-Richardson Co.	Lockland	Ohio
Price Brothers & Co., Ltd.	Riverbend, P. Q.	Canada
GROUP B		
Paterson Parchment Paper Co.	Bristol	Pennsylvania
Quebec North Shore Paper Co.	Baie Comeau, P. Q.	Canada
P. H. Glatfelter Co.	Spring Grove	Pennsylvania
The Champion Paper & Fibre Co.	Houston Division	Pasadena, Tex.
*Hummel-Ross Fibre Corporation	Hopewell	Virginia
GROUP C		
Southern Kraft Corporation	Continental Div.	York Haven, Pa.
Escanaba Paper Company	Escanaba	Michigan
The Eddy Paper Corp.	White Pigeon	Michigan
The Crystal Tissue Co.	Middletown	Ohio
Central Fibre Products Co.	Quincy	Illinois
Strathmore Paper Co.	Woronoco	Massachusetts
Bedford Pulp & Paper Co.	Big Island	Virginia
Donohue Brothers Ltd.	La Malbaie, P. Q.	Canada
American Writing Paper Corp.	Riverside No. 2	Holyoke, Mass.
**The Mead Corporation	The Harriman Co.	Harriman, Tenn.
The Mead Corporation	Sylva Paperboard Co.	Sylva, N. C.
GROUP D		
American Writing Paper Corp.	Linden Division	Holyoke, Mass.
Bird & Son, Inc.	Phillipsdale	Rhode Island
The Flintkote Company	Little Ferry	New Jersey
American Writing Paper Corp.	Nonotuck Div.	Holyoke, Mass.
American Asphalt Roof Corp.	Kansas City	Missouri
Spaulding Fibre Co., Inc.	Milton	New Hampshire
Crown Hellerbach Corporation	Crown Willamette Paper Co. Div.	Lebanon, Ore.
United States Gypsum Company	North Kansas City	Missouri
International Paper Co.	Livermore No. 11	Livermore Falls, Me.
American Writing Paper Corp.	Mt. Tom Div.	Holyoke, Mass.
The Mead Corporation	Nashville	Tennessee
Central Fibre Products Co.	Vincennes	Indiana
International Paper Co.	Riley No. 23	Riley, Me.
Hollingsworth & Whitney Co.	Aroostook & Cobbossee Mills	Gardiner, Me.
Central Fibre Products Co.	Mt. Carmel	Illinois
Hollingsworth & Whitney Co.	Abenaquis Mill	Madison, Me.
Spaulding Fibre Co., Inc.	Hayes	New Hampshire
Division II—Paper and Board Re-Manufacturing		
Gaylord Container Corp.	St. Louis	Missouri
Chicago Carton Co.	Chicago	Illinois
Union Bag & Paper Corp.	Chicago Bag Factory	Chicago, Ill.
Fort Orange Paper Co.	Castleton on Hudson	New York
The Container Company	Van Wert	Ohio
Kimberly-Clark Corp.	Atlas Mill	Appleton, Wis.
Bird and Son, Inc.	Chicago	Illinois
Container Corp. of America	Natick	Massachusetts
Bird and Son, Inc.	Shreveport	Louisiana
Container Corp. of America	Anderson	Indiana
Bay West Paper Co.	Green Bay	Wisconsin

*Reports delayed—covers one month only.
**September report missing—covers two months only.

SAFETY CONGRESS AT CHICAGO IN 1940

The National Safety Congress and Exposition—the world's largest safety event—will be held in Chicago in 1940.

Col. John Stilwell, president of the National Safety Council, which sponsors the Congress, announced today that the date of the Congress will be October 7-11 and that headquarters will be the Stevens Hotel.

This will be the twenty-ninth Congress and the seventh to be held in Chicago. Congresses were held in Chicago in 1914, 1927, 1929, 1931, 1933 and 1938. The 1939 Congress was held in Atlantic City, New Jersey, last month.

The Congress is the annual convention of members of the National Safety Council. Each year it attracts approximately 10,000 safety leaders from all parts of the country and from foreign countries.

The 1940 Congress program provides for 140 distinct sessions and 500 speakers. Every phase of accident prevention—industrial, traffic, home, school, farm, aviation, railroad, marine—will be covered. Manufacturers of safety products will have more than 125 exhibits.

So great will be the size and scope of the Congress that it not only will utilize the complete facilities of the Stevens Hotel—largest in the world—but will overflow into other hotels.

The Institute of Traffic Engineers will hold its annual convention in conjunction with the Congress and its members will participate actively in the Congress program.

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Convention Papers . . . Abridged

Papers presented at the Twenty-eighth annual congress of the National Safety Council, Atlantic City, N. J., October 16-20, 1939, have been digested and are so published. Final installment will appear in December.

Back Injuries in the Paper Industry, Their Cause and Prevention—From the Medical Director's Viewpoint

DR. J. B. MACLAREN, Chief Surgeon
Kimberly-Clark Corporation (Neenah)

"Lame Backs" as a topic rather than "Back Injuries" is preferable, unless we want to consider all pain in backs, which occur in the course of employment as injuries, or want to limit our discussion to fractures of the spine, which is only one narrow phase of back disabilities. Lame backs, as a term, embraces many more factors which may appear due to accident and which industry has had to pay for unjustly.

All backaches in industry are not due to injury, but often are the manifestations of disease and other conditions not dependent on occupation and its hazards.

Much confusion exists in the minds of the medical profession, lawyers and laity regarding back injuries. This is fostered by an indefinite terminology in which there is no uniformity of understanding, and a lack of those essential facts of anatomy, physiology, and pathology, which are essential to diagnosis.

To classify low back pain or even plain injury to the back seems impossible. In over eighty articles in the medical journals reviewed about a year ago, no two authors agree on a classification. To differentiate between what are the results of injury and what are the sequence of disease or inflammation is often impossible.

The prevention of low back pain is more important than its cure. This involves several points: (1) physical examination for employment; (2) re-examination when transferring from one type of labor to another; (3) periodic examinations for defects developed since last one; (4) adaptation to job; (5) proper instruction for work; (6) use of sufficient help.

There are definite injuries to the back which vary in severity and type. These can be diagnosed though it often requires an elaborate investigation and the proper summation of facts. The treatment after diagnosis is based on rest, and sometimes surgery.

Of greatest importance to the industrial surgeon and industry is prevention.

Back Injuries in the Paper Industry, Their Cause and Prevention—From the Safety Director's Viewpoint

WALTER E. STRONG, Personnel Director
Marathon Paper Mills Co. (Menasha)

How many injuries can you think of that were caused by improper lifting? Lifting with the back and not with the legs is no doubt the most common cause. This, plus the attempt to lift while out of balance, causes many back strains. How many cases were caused by overlifting where there was no reason for it?

The next most common cause, and one that is being gradually eliminated, is that of misplacement on the job (due to physical stature, age, and/ or general health). Why are men misplaced on jobs when they are employed? Is it because we are careless when we employ or do we fail to recognize certain weaknesses after employment, and fail to make necessary transfers where possible?

Floors in poor condition and poorly lighted stairways are two potential causes for back injury due to falling. Poor ladders, ladders without safety feet, lack of guard rails on scaffolds, and high platforms are all causes that we are well aware of but about which we sometimes get careless.

Carelessness is the cause of back injuries, and while in a broad sense we might place the blame for all injuries on carelessness of one type or another, it seems to me that in thinking of back strains only, it is the other fellow who is always careless and not the man injured.

Then we have what I call, for want of a better description, a "non-occupational cause." The records at our mill show conclusively that there are more lame backs during the first cool days in the fall and the first warm days in the spring. In the last analysis of these cases we have to depend upon the doctor's statement and many times he is very sympathetic toward the employee. We feel sure the real cause is often due to colds, infection from teeth and tonsils, lumbago, or general health conditions. Another condition we have to contend with at times is a recurrence of an injury sustained in previous employment.

One cause deserving mention and which perhaps is given little thought is the synthetic backache of the employee who dislikes his job. Of course, the man is bluffing, yet it is sometimes hard to prove.

What better method of prevention can there be than education? First instruction to the new employee is not sufficient. It must be repeated very often.

Pre-employment physical examination has been well described as a prevention and this procedure is unquestionably a most important preventative factor. Mills whose employment procedure includes this service have a distinct advantage.

Insistence in enforcing the rule of prompt reporting is an intangible prevention of back strains in some cases. Here again education plays an important part in that the employee learns that the longer he neglects to report a back injury the harder it will be to prove that it is the result of an injury at work.

We must endeavor at all times to maintain some semblance of balance in our judgment in accepting or denying liability on questionable cases, and I believe most employers do this. I advise the doctor's opinion where there is any question.

DISCUSSION

Extensive discussion was evoked by the reading of the two papers on back injuries.

One member brought up the point that the word "malingerer" should be carefully or seldom used when applied to back injuries or strain. He stated that in one instance it was difficult to ascertain whether the complaining party had anything wrong with him or not and it was only after extensive diagnosis that it was discovered that the party was actually suffering.

After another member had cited several instances regarding injuries and compensation, the chairman of the session asked the member to point out what can be done about the increasing number of back injuries reported. It was subsquently brought out that competitive state insurance, such as is used in New York, was a good thing from the compensation angle. The Industrial Commission makes an examination and checks up and gives the employer and employee information as to what the law is and what to do about it, one member pointed out.

Quite a bit of discussion followed as to the problem of back strains as confused with ordinary rheumatism and how compensation should be arranged. It was brought out that every state varies in its acceptance of the occupational disabilities under which back strain is classified. It was stressed by one party that labor has been educated and must be educated further as to its acceptance of a physical examination program, a program which will not discriminate against the employee, but will place him properly. Another member asserted that his company had fewer accidents since it had death and sick benefits and that the workers were not "chiselers" but were more fit mentally, when they knew they were going to get paid when they were actually sick.

The main speaker stressed the fact that an honest physical examination by one who is interested, not only in the employee and the proper placing of the employee, but in the company also, as far as there future liability is concerned, is the only form of physical examination to be made.

The Supervisor's Place of the Safety Program—From the Viewpoint of the Mill Manager

T. M. BARRY, Mills Manager
Fraser Paper Co., Ltd.

The supervisor has a definite moral obligation toward the men working under him that he do everything possible to reduce to a minimum the human suffering caused by mill accidents. . . .

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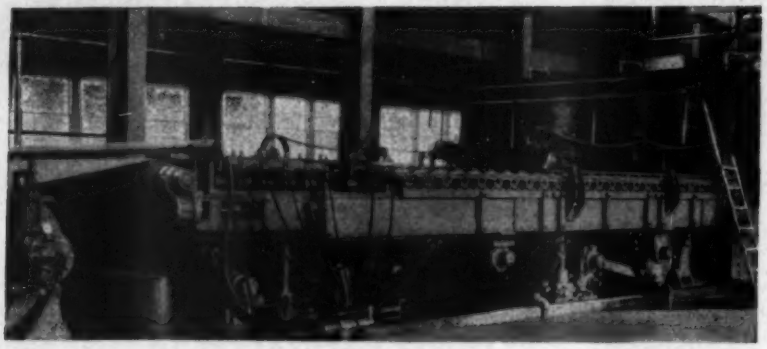

210" Simplex Fourdrinier at Crossett Paper Mills

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It is the supervisor's duty to see that low costs are maintained by utilizing man power and machinery to the best advantage. . . . The failure of man power by accident increases operating costs in many ways. There are losses due to a decrease in production. There is the cost of training substitutes and usually there is a lower production rate during this training period, partly because of inefficiency and partly because of the psychological affect the accident may have had on the other workers. Doctor bills and compensation have also to be paid. . . .

The mill manager should take the lead if the safety program is to be successful. . . . It is inadvisable to pass this work along to a subordinate because his words do not carry the same authority. I consider that the appointment of a safety engineer or a safety supervisor is a necessity, but he should report directly to the mill manager and the line of authority will run from the mill manager's office to the other subordinate's offices.

The employees must be made to realize that executives of the company, the mill manager and the other supervisors are keenly interested in the welfare of the employees. . . .

The presentation of safety suggestions should be encouraged and prompt action taken on them. They should be publicly acknowledged by compliment, or possibly in some instances, by reward. . . .

All employees must be convinced that accidents can be prevented if everyone will concentrate on this work. Organized safety committees, the dissemination of safety information by bulletins, pamphlets, lectures and films and the holding of general safety meetings periodically all help to convert the worker to this viewpoint. . . .

The supervisor's attitude towards safety work must be actively positive and there should be no let down in the continuity of the program. . . . A definite policy should be agreed upon and adhered to by all, with the supervisors taking the lead. . . .

The majority of mill accidents are the result of failure of man power. Employee training is therefore being stressed more and more and I feel that this work when carried out properly can be a very powerful factor in keeping accidents at a minimum. . . .

Complaints or grievances should be settled with a minimum of delay and some companies have ruled that all complaints or grievances must be reported within three or four days of the occurrence; otherwise, they are outlawed. . . .

First-aid training, given with the understanding that it should be resorted to in emergency cases only, pending the arrival of the nurse or doctor, would seem to have its place on the safety program. . . .

All new equipment and additions should be carefully inspected by all concerned. . . .

I have stated that both from a moral and mercenary standpoint the supervisor must place accident prevention work on a part with any of his other duties. . . .

The Supervisor's Place on the Safety Program—From the Viewpoint of the Mill Worker

J. F. PAVLIS, Fireman and Engineer
The Flintkote Co.

I have chosen the human side—the human relationship between the foreman and the man—for the subject of this talk.

First, let's consider the new employee. Records show that its the new employee who gets hurt most often.

The new man should be made to feel immediately that he is one of the gang. . . . As the foreman proceeds to acquaint the employee with his duties, it would be well for him to acquaint himself, too, with the personality of the man, judge his mental capacity, his weaknesses and his capabilities. . . .

A friendly foreman puts the new employee at ease, lets him keep his mind on his work and its possible hazards, without worrying what the boss thinks of him. . . . A tough, thoughtless foreman sometimes makes the new man nervous and jittery, afraid to ask questions, with the result that he is an unsafe worker and the foreman, if he only knew it, is to blame.

Then, there's the attention paid by the foreman toward the request of both new and old employees. How fine it makes you feel when he will stop and listen to you as you report some defect in the machinery you are operating or some job you are doing with the assurance that he will have it fixed right away. . . .

Men want safe conditions. Men don't want to get hurt, but if they can't get co-operation from their foremen, they soon give up trying. . . .

Let's consider next the attitude of the foreman when the man makes an error. . . . How does the foreman handle it? We don't feel so badly when the foreman will come over and say "No, Jack, you made a bum guess on this thing, and you didn't use your head, and I have to answer for it, but I'll try and adjust it with the big boss." But when the foreman who sits in a little office in a corner of his department and governs us by remote control, sits down and writes a long letter to the big boss, we feel we have committed an unpardonable blunder. The first guy has made us feel that just for his sake the error will never be repeated. With the second foreman, the thought with us will be "O.K. pal, I'll get even with you for this." . . . Which type of foreman will have the safest department?

The employee has a right to expect thoughtful consideration of his health. An employee sick or half sick is a human hazard, much more dangerous than any mechanical hazard. . . .

Mutual co-operation prevents accidents. If the men feel free to discuss hazardous situations in their department with their foreman and with each other . . . then through the vigilance of the group, hazards will be eliminated. . . .

Safety rules are necessary. Ideas on accident prevention are to be encouraged, but ideas alone without the co-operation of employees and foreman, built on mutual friendship, go for naught. . . .

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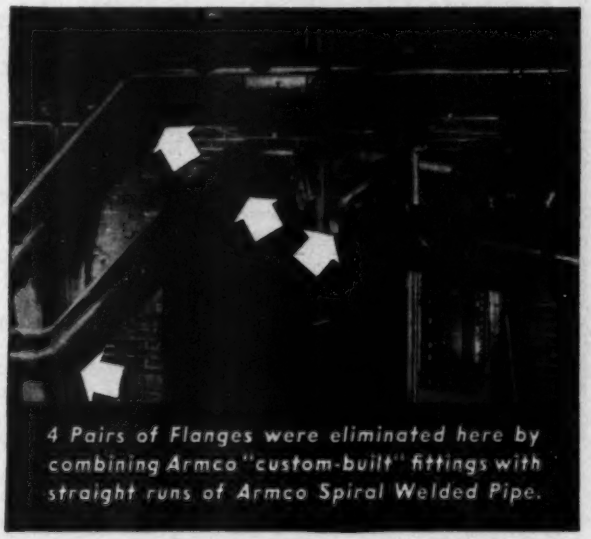

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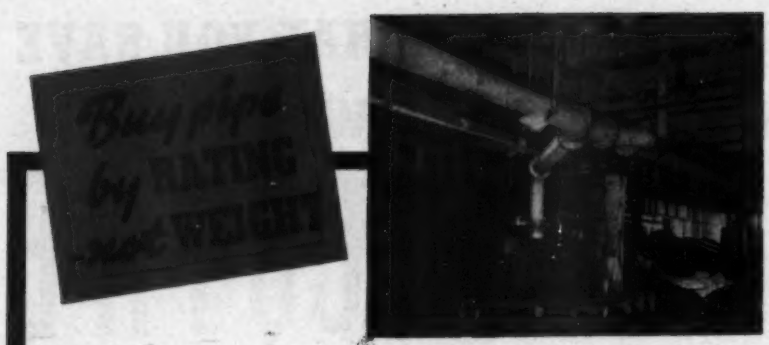

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The safe foreman will show this by the way he handles, first, the new employee; second, the safety suggestions of his men; third, the man who makes an error; fourth, the health of his men, and lastly, the general feelings of his men to secure their willing co-operation toward safe practices in the work.

NOTE

There was no discussion after the presentation of these papers.

Mr. Pavlis preceded his actual talk by a semi-humorous explanation of how he came to be selected as a speaker on the program and his reactions to the meeting. Throughout his actual speech, Mr. Pavlis interpolated with examples of the issues he was stressing. Few members attending this session will forget Mr. Pavlis' story of the druggist and the pills and other of his witticisms!

In illustrating the point that the foreman should pay adequate attention to his men, Mr. Pavlis cited an instance in which his company had hired a new man. The new man did not have his lunch with him and had no money to buy any. The men chipped in and one man was sent to ask the foreman for a pass to get outside the gate. The foreman heard of the story and sent the man back with his own lunch for the new man. Thus, Mr. Pavlis pointed out, mutual cooperation is a decided benefit, since by using it the men can be more responsible for their own and others' safety. The "getting something for nothing" idea can be used advantageously, Mr. Pavlis illustrated. If a worker thinks he is getting "three bucks" worth by going to a doctor to get a physical examination for which he does not pay, he will go to the doctor.

A man can't be driven to a doctor, it was stated, but if he can be convinced he is getting something for nothing, he will go.

How Can Job Analysis and Merit Rating Programs Help Solve Your Accident and Prevention Problems

C. R. DOOLEY, Mgr. Indus. Relations
Socony-Vacuum Oil Co., Inc.

The responsibility for the job of accident prevention falls upon the management, supervisory force, and the employees. The lack of co-operation on the part of any one of these renders even the best efforts on the part of the other two almost futile. The management must establish and constantly back up sound policies; the supervisory force must not slight accident prevention policies in favor of other policies which may at the moment appear in conflict, and, of course, the constantly careful and intelligent performance on the part of all employees is vital.

The responsibilities of management, supervisors and employees are of many kinds; they overlap in places; many details are left to be either assumed or picked up casually; there are borderlines of misunderstanding and doubt of both fact and intent. The value of an anlysis of jobs would seem almost self-evident.

Merit rating programs are few and far between. The difficulty lies more with the method than with the objective because on every hand there is need of some kind of performance rating. . . .

Job analysis has a number of objectives two of which are (1) to determine what the duties of the job are and (2) to determine those educational or training needs in connection with the whole job, or any of its parts, that the employee requires in order to do the job efficiently and therefore without accident.

An employee cannot properly function in his job (including safe operation) until he has a clear understanding of what is expected of him. Furthermore the supervisor is very often confused regarding what to expect of his employees. Obtaining a statement of duties from each employee, portraying his conception of his own job (which is the starting point in developing a job analysis) not only brings to light some duties which he has assumed on his own responsibility, but sometimes shows the supervisor, for the first time, that the men should rightfully perform some of these assumed duties.

A supervisor should have a complete knowledge of all the necessary operations required of his department. Therefore, job analysis serves the double purpose of clarifying in the employee's mind what his job actually is, and bringing the management up-to-date on what should fairly be expected of the employee. . . .

When accident hazards are discovered, that is the first step toward the preparation of an accident prevention manual, laying down safe practices on each job. . . .

A complete job analysis provides an excellent introductory guide for the new employee and that permits a full interpretation of the hazards of each part of the job as it is taken up. . . .

The performance of a plant foreman with relation to safety is up to standard when (1) there are no avoidable accidents due to disregard of the safe practice manual, (2) when unsafe conditions are promptly reported and recommendations made, (3) when all fire drills are held according to schedule, (4) when inspection of fire fighting apparatus indicates that it is in specified condition, (5) when no failures of equipment are due to neglect of following operating and maintenance procedures.

Repair jobs done to a high standard as prescribed in job analysis result in less chance of breakage, ruptures, explosions, etc., and naturally better accident records result if in the merit rating program, the employees accident prevention performance measured against job analysis standards is a subject of rating. Merit rating programs should produce good housekeepers, hence safe working conditions. It should produce better machine maintenance and operation hence, fewer hazards.

A thoroughly and properly developed job analysis should help solve accident prevention problems by establishing a better psychological condition among employees. It should clarify responsibility and authority, hence giving accident prevention its proper place among the worker's functions. It should expedite the flow of accident prevention instruction and material. It should eliminate buck-passing. It should

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familiarize workers with avenues through which elimination of hazards may be affected. It should effect greater co-operation through better understanding and full recognition by both management and employees that accident prevention has its place among the important objectives.

DISCUSSION

The question was raised as to whether a merit rating is not only a check and a measure of the individual employee but a check and a measure on the foreman as well. It was stated that the foreman might rate a man low in accident prevention based on facts, but if the foreman's ratings were inconsistent, it would seem that he would be apt to have a bad safety record himself.

It was asserted that fundamentally a merit rating is a complete analysis of the duties and responsibilities and methods and procedures of the job and also a check up on at least enough of those items to show the man is functioning.

The question was asked if a merit-rating system should be put in without a job analysis. The reply was that you cannot employ a man or do anything without a job analysis. Merit rating is the study of the man, while job analysis is the study of a job. It was stressed that the worker is rated on the various items in the job analysis—if he does them properly the safety record is improved.

The papers presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Syracuse, New York, September 12, 13, and 14, 1939, have been digested and are so published. The first installment appeared in the October issue. The final installment will appear in December.

The Manufacture and Uses of Chlorine

PAUL A. KEENE, Chief Chemist
The Solvay Process Company

The commercial processes for the manufacture of chlorine may be divided into two main groups, chemical and electrolytic.

The two principal chemical methods which supplied the chlorine of commerce prior to about 1910 are the Weldon and the Deacon processes. The Weldon process involves the oxidation of hydrochloric acid from salt cake furnaces by manganese dioxide, with subsequent regeneration of the manganese dioxide.

The Deacon process involves the oxidation of hydrochloric acid by air with the aid of copper chloride as a catalyst, the reaction reaching a definite equilibrium depending on the temperature and pressure involved.

Another chemical process, involving the reaction between common salt and nitric acid, has been studied for many years and has been recognized as a potential source of chlorine since as early as 1838, but only during the past two years has it been developed to the point where its use is practical.

The development of the electrolytic processes of manufacture has brought chlorine to its present important place in the industry. These may be divided into three main types: the electrolysis of used salts; electrolysis of salt solutions in mercury cathode cells; and electrolysis of salt solutions in diaphragm cells.

The diaphragm cell is the most widely used form of chlorine producing equipment. It depends for its operation on the interposing of a porous diaphragm between the electrodes so as to prevent reaction between the caustic soda produced at the cathode and the chlorine saturated brine surrounding the anode.

Electrical power for cells has in the past been furnished almost exclusively by motor generator sets, but recently mercury arc rectifiers have been coming into prominence on account of their high conversion efficiency, simplicity of operation and relatively low cost.

The principal types of cell in commercial operation are the Allen-Moore, Vorce, Gibbs, Marsh, Dow, Nelson, Wheeler, Townsend, Tucker and Stuart.

As the chlorine gas leaves the cell, it is saturated with moisture at the prevailing temperature conditions, and contains usually small percentages of hydrogen, CO_2 and air. The first step in the purification is drying, which is accomplished by cooling, either by direct water scrubbing or in interchangers, and then bubbling through concentrated sulphuric acid.

Liquefaction may be accomplished by cooling to a sufficiently low temperature, but it is customary to apply some pressure at this stage of the operation. The temperature and pressure used are governed by the extent of liquefaction desired.

The liquid chlorine, at low temperature, is now ready to go to storage or into the containers in which it is to be shipped.

Chlorine is commercially available in three types of container: the 100 or 150 lb. cylinder equipped with a single valve; the multiple unit car, consisting of 15 separately removable containers, each holding one ton, mounted on an underframe; the single unit tank car, available in 16 and 30 ton capacities.

The use of chlorine in major quantities has developed within the past few years.

Prior to about 1936, the pulp and paper industry was the largest consumer, and it is quite possible that if all the chlorine made and consumed were included, it would still be in the lead.

The availability of liquid chlorine in quantity and at a low price has revolutionized many of the operations of the paper industry. The principal uses are in pulping, bleaching and slime control and sterilization.

The Pomilio process of pulping consists of the cooking of straw or bamboo with a weak caustic solution, followed by chlorination.

The evolution of pulp bleaching practice during the last ten years has been a progressive development from original single stage

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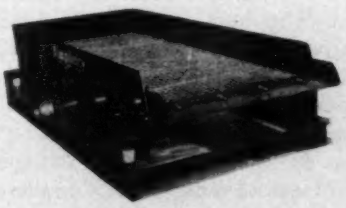

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methods to multistage methods of increasing complexity.

The application of bleaching processes of varying degrees of complexity may be strikingly illustrated by reference to kraft pulp, which, for various purposes, is desired in all degrees of whiteness from the practically unbleached wrapping papers to the high shades of white comparable to sulphite pulps. The simplest procedure for a semi-bleached product is that involving a single stage hypochlorite treatment. A three stage process including chlorination-caustic extraction-hypochlorite, produces a medium shade of white. For the higher whites, with a G. E. brightness of 80-85, four or more stages including chlorination-caustic extraction-hypochlorite are used.

A recent development of research has shown that in such a process, it is entirely feasible to combine caustic extraction with a primary hypochlorite stage, thus obtaining the advantages of a five stage system in four stages, without the necessity of additional tanks, washers, and other equipment.

Another important application of chlorine in the paper industry is in the treatment of water. Water is one of the most important raw materials in a paper mill, and the greatest obstacle to reuse is the formation of slime, consisting principally of algae or fungous growths. The paper mill slurries constitute an ideal medium for the growth of such organisms, and unless held in check, these growths will accumulate, and eventually break loose, causing spots in the paper, and serious degradation of quality.

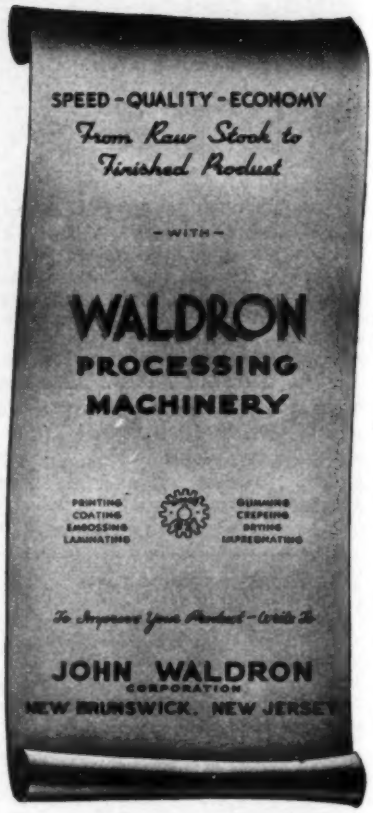
The use of chlorine and its compounds is the standard method of alleviating this trouble. In many cases, chlorine alone has been found to be effective, but more recently, the trend has been toward the use of ammonia along with the chlorine, thus producing chloramine in the solutions.

In addition to the sterilization of water, chlorine is used for taste and odor control in water supplies; control of algae growths, iron bacteria, etc. It is an aid to coagulation and by cleansing pipes it maintains pipe carrying capacity.

A chlorine gas mask of a design approved by the United States Bureau of Mines must be readily available wherever chlorine is used. Each operator should have his own mask for his own personal use, and should be responsible for keeping it in condition suitable for immediate use. Every person employed in the vicinity where chlorine is used should be instructed in the procedure to be followed in case of exposure to the gas, these instructions being available from many reliable sources.

Under normal conditions there is no reason to permit any harmful concentration of chlorine to exist. A chlorine leak may be easily detected by means of a solution of ammonia, and should be immediately remedied. In case of accidental spillages of liquid or leaks which cannot be readily controlled, emergency measures may be required. Any alkaline material, such as lime, soda ash or caustic soda, will readily combine with chlorine, and may be used to absorb either the liquid or gas. Plain water alone will cause the formation of chlorine hydrate, thereby reducing the rate of vaporization from the spilled liquid. In some cases dry ice has been used to cool the chlorine cylinder and thereby reduce the pressure.

Under no conditions should containers be heated in order to increase the rate of removal. If the chlorine will not come out fast enough under its own pressure, dry conditioned compressed air may be used under suitable prescribed conditions, and the liquid vaporized in suitable external equipment. More detailed instructions as to safe handling procedure will be gladly furnished to any one interested by any chlorine manufacturer.



The Lime-Chlorine System in the Preparation of Calcium Hypochlorite

J. D. RUE[1] and F. W. O'NEIL[2]

A series of pH determinations were made during the chlorination of milk of lime suspensions at various temperatures and concentrations of total and available chlorine.

The solution was prepared by mixing a predetermined amount of hydrated lime in a known amount of water and then bubbling chlorine gas into the mixture. A sample of the solution was taken at the start and then at definite intervals during the chlorination of the milk of lime. These samples were tested for pH, using the Coleman pH electrometer with a glass electrode, standardized with potassium acid

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phthalate at pH of 3.97 and sodium hydroxide—sodium chloride glycocal at pH of 11.5; and for total and available chlorine by standard methods. A potentiometric titration was also made on a solution of calcium hypochlorite using HCl.

The lime used for the bleach liquor preparation had the following analysis:

CO_2	1.41
H_2O	23.47
CaO	72.90
SiO_2	1.09
R_2O_3	0.58
MgO	0.66
	100.11

Results showed that as the chlorination proceeded the change in pH was only 1.0 to 1.2 pH units until the normal end-point, as determined in commercial practice, was reached, regardless of the temperature or concentration, within the limits studied. The end point was indicated by a three second flash of phenolphthalein and was equivalent to 11.2 pH. Further chlorination produced a decided drop in pH with almost negligible increase in available chlorine concentration. Below 8.5 pH the loss of available chlorine was noticeable.

The further the pH falls below 11.2 the greater is the loss in available chlorine on standing. A solution containing 32 g. per liter $Ca(OH)_2$ and approximately 30 g. per liter of available chlorine will, at pH of 5, lose practically all of its available chlorine on standing for 24 hr. at room temperature.

It is possible to restabilize a solution that has passed the desired pH by the addition, within a few minutes of the time the end-point was passed, of sufficient hydrated lime to bring the pH above 11.2. This solution will then remain stable at least over a period of 48 hours.

It appears that there are three points which are of extreme importance to the papermaker:

(a) The bleach liquor must be kept at pH greater than 11.2 for complete stability.

(b) The bleach liquor which has been allowed to drop to a pH lower than this may be reestablished by the prompt addition of hydrated lime.

(c) The bleach liquor system is an exceedingly complex system, and in order to maintain consistent results in the bleach plant, the bleach liquor preparation methods as well as the bleaching conditions must be kept constant.

(1) Engineer, Hooker Electrochemical Company.
(2) Instructor in Pulp and Paper Manufacture, New York State College of Forestry.

Application of a Quantitative Technique to the Evaluation of Color Stability of Bleached Pulps. Influence of Machine Drying and Natural Aging Upon This Evaluation

JAMES W. McINTYRE

The Institute of Paper Chemistry

Using specially constructed equipment, a study was made of the effect of temperature and humidity upon the rate of discoloration of bleached sulphite pulp. Discoloration rates were determined by the method of Tongren using reflectivities as measured at 458 mm. by the General Electric recording spectrophotometer. A minimum point in the rate of discoloration was found at about 20 per cent relative humidity at 85 deg. and 95 deg. C., respectively. Other temperatures were not investigated thoroughly.

Extension of the humidity-rate of discoloration study at 95 deg. C. to include other types of pulp showed that the position of the minimum rate of discoloration was variable, a soda pulp showing no minimum rate down to 2.0 per cent relative humidity. As a result of this, the relative values of accelerated discoloration rates of various pulps are dependent upon the humidity of the aging atmosphere.

The theory was postulated that rates of discoloration determined at a humidity which would maintain a normal moisture content in the sheets at the aging temperature should parallel most closely the results of natural aging. Accordingly, 55.4 per cent relative humidity at 95 deg. C. was arbitrarily adopted as a standard aging condition. Under these conditions, a moisture content of about 5.7 per cent was maintained in the sheets during aging.

In a study of some of the variables of pulp handling prior to accelerated aging tests, it was found that heat-drying of bleached sulphite pulp prior to handsheet preparation caused a marked increase in subsequent color stability. The increase in color permanency is not due to the reduction in reflectance which occurs during the machine-drying of pulp. When dry sheets are heated, although they may undergo a loss in reflectance comparable to that occasioned by machine-drying, their rate of accelerated discoloration is unchanged. Thus it appears that in the presence of heat and moisture some reaction occurs in sulphite pulp which, although reducing the reflectance somewhat, tends to stabilize this property to a marked extent.

In an evaluation of the effect of wet storage of pulp upon subsequent accelerated aging behavior, it was found that thirty days storage of a bleached sulphite pulp as wet laps reduced the accelerated discoloration rate of air-dried handsheets prepared therefrom to 73.0 per cent of the value of handsheets prepared from the freshly bleached pulp.

Dry storage of air-dried handsheets made from a slush pulp, although causing a marked reduction in reflectivity, caused no change in subsequent accelerated discoloration rate. A slight increase in aging rate, after similar storage, was observed for air-dried handsheets prepared from machine-dried pulp.

Natural aging studies carried out on the various pulps showed that the results of the accelerated tests at 95 deg. C. and 55.4 per cent relative humidity paralleled the rates of naturally occurring discoloration better than did the results of the accelerated tests at 2.0 per cent relative humidity. The relation of natural discoloration rate to accelerated discoloration rate as determined was not constant, since the natural aging

rate was subject to greater percentage change by reason of prior pulp treatment than was the accelerated rate.

Bleaching Procedure Design for High White Strength Kraft

WARREN A. CHILSON
Hooker Electrochemical Company

Common knowledge of kraft bleaching and of chemical costs dictates the use of three reactions as fundamental for the bleaching of kraft pulps to shades of high whiteness. These reactions in the order of their use are chlorination, caustic extraction and oxidation by hypochlorite.

Forcing the chlorination and caustic extraction steps in order to remove the greatest percentage of impurities has been found to be within limits, highly desirable. Forcing the last step, hypochlorite, on the other hand, has been found to be detrimental to pulp quality.

Increasing the severity of the caustic extraction beyond a certain point progressively dissolves hemi-celluloses which are responsible and desirable for certain paper making qualities. Increasing the effectiveness of the caustic extraction does reduce the demand for hypochlorite but the advisability of forcing this reaction must be considered in the light of a reduction in pulp yield before such measures are recommended.

Research has pointed out the fact that the majority of the impurities present in kraft pulp are more readily oxidized than is the cellulose itself. Hence, the hypochlorine reaction can be forced with greater safety in the case of pulps in a less purified state.

The addition of a second hypochlorite in the sequence just previous to the final hypochlorite has been tried in several bleacheries and an improvement in color has been obtained without noticeable reduction in strength. The addition of a hypochlorite just previous to the caustic extraction has also been tried and in this location the hypochlorite is reported to be even more effective. Inserting a hypochlorite in the sequence in this latter location results in the creation of a four-stage procedure with each stage concluded by a wash.

It also has been found that a chlorination and a hypochlorite reaction can be combined to advantage in one stage, without a wash between them. This combination results in a slight loss in chemical economy, but in the production of a stronger pulp and in the elimination of one stage.

To increase the stability of the pulps produced, double washings with soaking stages in between are often found necessary. Soaking stages are highly recommended, especially after the caustic extraction and after the last hypochlorite. Previous to the soaking stage following the last hypochlorite, the suspension is often made slightly acid to assist in the final washing. This adjustment is preferably made with sulphurous acid because of its iron reducing and antichlor properties.

Limited laboratory tests lead to the expectation that a third hypochlorite inserted after the first hypochlorite is effective for the production of still brighter pulps. A procedure for white high strength kraft might, therefore, have the following sequence: (1) combined chlorination and hypochlorite; wash; (2) hypochlorite; wash; (3) caustic extraction; wash; (4) water soak; wash; (5) hypochlorite; wash; (6) acid adjustment; and final wash.

The disadvantage of combining the chlorination and hypochlorite reactions into one stage in the manner previously discussed is a slight increase in chemical cost. The elimination of the wash after the chlorination is largely responsible for this increase in chemical requirement.

The advantages of combining the chlorination and hypochlorite reaction may be briefly summarized as follows: (1) a stronger pulp can be produced because the chlorination can be forced to a degree beyond that possible with a separate chlorination and a concentrated buffered hypochlorite can be made available immediately following the forced chlorination; and (2) equipment and installation costs can be lower.

Batch and continuous operations can be employed for any of the steps described.

Considering the procedure as a whole, batch methods are desirable when the changes in grade of product are frequent because the identity of a batch can be maintained throughout the procedure. Where grade and production are uniform over a long period of time, strictly continuous operation is applicable. Even here, however, it may be desirable to make the last stage batch to put in the hands of the operator some means of correcting irregularities.

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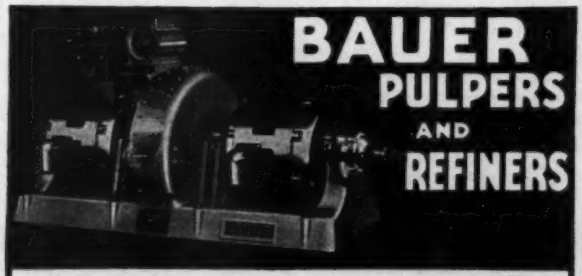

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Machinery for Ground Wood and Chemical Pulp

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ALLIED

ELECTRIC AIR CLEANER EATS DIRT

In a dramatic demonstration lecture on October 12, at Hotel Morrison in Chicago, George F. Begoon, Manager of Precipitron sales for Westinghouse Electric & Manufacturing Company, revealed to a good-sized and attentive audience of engineers, architects, and utility men how simple a job it is to clean air electrostatically and how thorough a job is done by this kind of cleaning.

Seven white circular discs ranging in diameter from one-sixteenth of an inch to four feet were displayed during the lecture as scale models of typical dirt and dust particles found in the air. These discs showed how large tobacco smoke particles, ragweed pollen, puffball spores and abrasive dust would appear if magnified 25,000 times.

The electrostatic air cleaner, treated in the lecture and known as the Precipitron, was developed by Gaylord W. Penney, manager of the electro-physics division of the Westinghouse Research Division, by utilizing the fundamental principle of physics that oppositely charged particles are attracted to each other. All dust particles passing into the cleaner receive a positive charge, and then these positively charged particles are attracted to negative plates and grounded.

This unique cleaning job is performed by two electrical units — a power pack to supply the necessary voltage, and a combined ionizer and collector cell.

The simplicity of the device was demonstrated by arranging two standard units in a glass-walled section of a ventilating duct, then introducing dense smoke into the duct, and finally turning on the electric power. The smoke vanished as it passed over the collector cells of the two-unit arrangement.

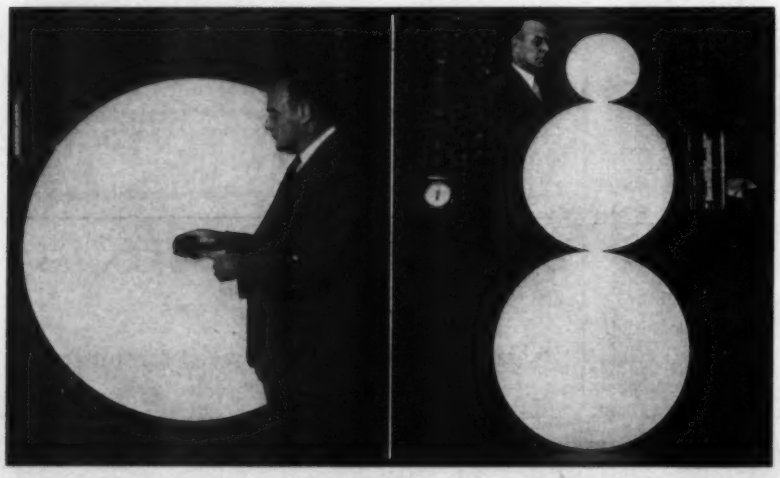
◆

WELDING AWARDS

Two notable awards for contributions to the science and art of arc welding were presented during the recent annual meeting of the American Welding Society at Chicago. Presentation of the Lincoln Gold Medal for 1938-39 and the 1938 Miller Memorial Award featured the opening session of the meeting on October 23 at the Hotel Stevens.

The Miller Medal, donated by the American Welding Society to commemorate the contributions of Samuel Wylie Miller to the science and art of welding, was presented to C. J. Holslag, president, general manager and chief engineer of the Electric Arc Cutting and Welding Company, Newark, New Jersey.

The award was presented for Mr. Holslag's able pioneering in the development of A-C arc welding and covered electrodes. Award of the Lincoln Gold Medal, donated to the American Welding Society yearly by James F. Lincoln, was made to Messrs. G. O. Hoglund of the Aluminum Company of America and G. S. Bernard, Jr., of the Aluminum Cooking Utensil Company.



Left—These models show the variation in size of particles snatched from the air electrically by the Precipitron—the large white circle representing ragweed pollen; the white dot in the center of the black circle, a cigarette smoke particle. In making the models, the particle size in each case was enlarged 25,000 times . . . Right—From top to bottom, the white circles show the relative size of golden rod pollen, carbon, and fly ash particles. Actual dimension of each particle enlarged about 25,000 times in original circles.

◆

H. GAGE CHAIRMAN IPI CONTEST JURY

Harry L. Gage, vice president of the Mergenthaler Linotype Company, Inc., will serve once more as chairman of the jury for the IPI Essay Contest, it was announced recently by Fred J. Hartman, chairman of the contest committee. Mr. Hartman is educational director of the National Graphic Arts Education Guild, co-sponsors of the competition with the International Printing Ink Corporation. Serving with Mr. Gage on the jury for the Fourth Annual Contest are J. L. Frazier, editor of *The Inland Printer;* Laurence B. Siegfried, editor of *The American Printer,* and Ernest F. Trotter, editor of *Printing.*

◆

RUSH WORK ON NEW CANADIAN CHLORINE PLANT

Increased activity in the newsprint and textile industries has led Canadian Industries, Ltd., to rush work on its new chlorine plant at Shawinigan Falls.

In order to round out this unit of the company's alkali division, the erection of a caustic soda finishing plant is being undertaken and ground has already been broken for this portion of the work. Construction will be rushed forward as rapidly as possible with the expectancy that it will be ready for operation by the early spring.

The new section will be a one-story building occupying an area of 126 feet by 180 feet, with reinforced concrete foundation and structural steel and brick superstructure. Company officials estimate that the cost of extensions, with equipment, will be in the neighborhood of $400,000.

◆

GERMANY LEADS U. S. A. IN PAPER MACH'Y EXPORTS

Of interest to American pulp and paper mill machinery manufacturers is a press memorandum regarding a report of the Machinery Division of the United States Department of Commerce on exports.

The report brings out that official

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The Brassert Strainer requires but little power, practically no attention. Built in sizes to fit 2" to 30" line connections. May be installed in or out of doors. Bulletin PI gives complete engineering data and performance figures. Why not write for a copy?

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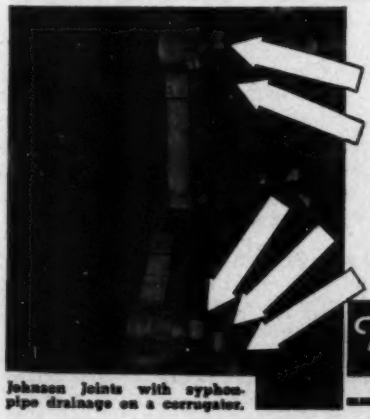

Johnson Joints with syphon-pipe drainage on a corrugator.

A BIG ORDER—*but we filled it!*

• It was our intimate knowledge of the needs of the paper mill that led to the development of the Johnson Rotary Pressure Joint. We knew the troubles that were experienced with the old-time "steam fits"—the frequent repair and replacement; the oiling and adjusting. We knew that operating men would welcome a long-lived, oil-less, self-adjusting, self-aligning joint.

From the standpoint of design it was a large order—but we filled it, and today scores of mills know the difference between the old steam fits that led a short life and a miserable one, as contrasted with this new type that lives a long life and a happy one.

Surely you are taking advantage of this development. If not, write today for the time and dollar-saving details.

Product of The Johnson Corporation
845 WOOD STREET, THREE RIVERS, MICHIGAN

German statistics show exports of paper and pulp mill machinery in 1938 totaling 15,630,000 reichmarks ($6,277,200), almost six times the corresponding American foreign sales valued at $1,079,000. According to the report the German exporters, favored by the export subsidy program of their government, including barter and exchange agreements which enabled them to quote extremely competitive prices and credit terms, outsold American exporters on practically all foreign markets and made substantial sales to some countries where United States producers did not obtain any business during the year.

This was not only true of the European market, the report asserts, but also in Latin America and other sales areas.

German foreign sales of paper and pulp mill machinery to European markets totaled $3,365,700 while shipments of similar equipment from the United States to European markets were valued at $232,825, practically all of which went to the United Kingdom. German exports to Asiatic markets totaled $1,975,000 while corresponding American shipments amounted to $1532.

In Latin America, Germany shipped pulp and paper mill machinery in 1938 to the value of $867,900 while American shipments aggregated $355,008. Cuban purchases totaling $268,878 constituted the bulk of the Latin America business obtained by American paper and pulp mill exporters during the year.

◆

G-E TO HAVE NEW MIDWEST HEADQUARTERS

Contracts were awarded recently by the General Electric Company for the construction of its new Midwest headquarters to be located in Chicago. Work on the project, which has already started, will represent an investment of nearly two million dollars.

The new building, which will house various activities of G-E now occupying leased space in nine different buildings, will occupy an entire city block and will be seven stories tall. The company's Chicago offices will be moved to the new building, as will the General Electric Supply Corporation, R. Cooper Jr., Inc., the service shops, and the district and appliances department. Holabird and Root are the architects. Contract for the building's erection was awarded to the James Stewart Corporation. The building is scheduled to be completed by October 1, 1940.

CLEVELAND TRAMRAIL

ARCH BEAMS

RIGHT: One ton Cleveland Tramrail electric hoist with hand-propelled carrier operating on Cleveland Tramrail arch beams.

A SIZE FOR EVERY PURPOSE
—for loads up to 5 tons

Arch beams are used for applications where regular Cleveland Tramrail rail does not lend itself to long spans or where satisfactory superstructure cannot be provided.

They consist of a wide flanged "T" member to which is welded a high-carbon long-wearing Tramrail rail with flat raised treads. The treads are hard and smooth. They eliminate troublesome pening which is common with systems subjected to severe service and continued rolling action of carriers.

Tramrail arch beams are an exclusive Cleveland Tramrail development and are available in six different depths to suit varying span conditions. They represent one of the many reasons why Cleveland Tramrail can serve you better.

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OVERHEAD MATERIALS HANDLING EQUIPMENT
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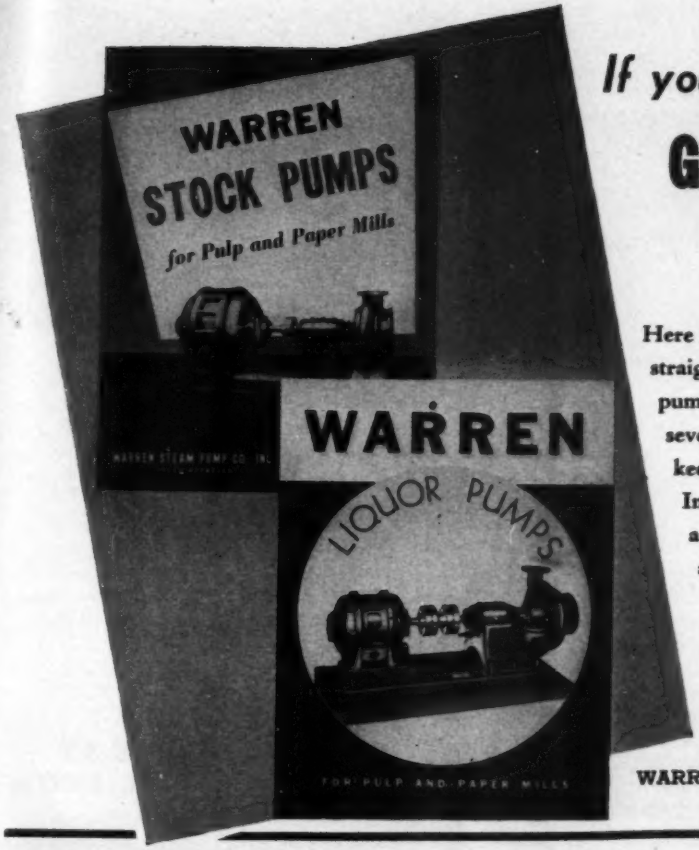
VERMILYE MEDAL TO J-M PRESIDENT

Lewis H. Brown, president of the Johns-Manville Corporation, will be the first recipient of the Vermilye Medal, new award of the Franklin Institute of the State of Pennsylvania "in recognition of outstanding contribution in the field of industrial management." The medal will be presented to the J-M executive on Tuesday, November 14.

Named after its donor, William M. Vermilye, vice president of the National City Bank of New York, the medal is purposed to stimulate, encourage and recognize outstanding contributions in the field of industrial management not only in the United States but in other countries as well. Mr. Brown will receive the medal for "his brilliant work in executive management, in industry."

◆

▶▶▶ PLANS FOR AN EXPANSION of its plant in the Bronx, New York City, were announced by the National Gypsum Company recently. The new additions will result in an expenditure of about $1,000,000, it was said.



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NO MAINTENANCE IN A YEAR OR MORE OF OPERATION

This new Murray Flat Screen is one of a number in continuous operation for over a year in a leading paper mill without even a wrench being applied. Its capacity is greater, stock cleaner, power less than other types of equipment, aside from its minimum maintenance. This screen has a special drive developed to meet exacting and heavy-duty requirements at high speed—modern equipment for the mill that must improve quality and cut operation costs to meet competition. Repeat orders from users of the New Murray Flat Screens testify to satisfactory performance. Write for complete details.

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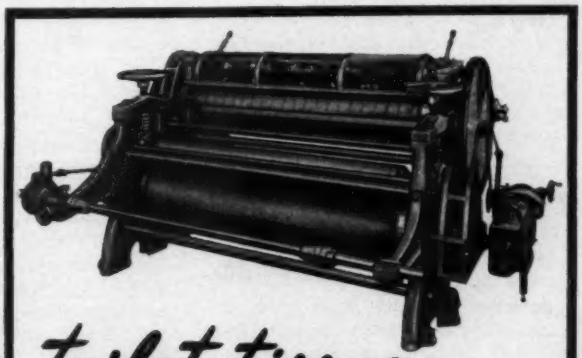

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Cameron Machine Company's permanent exhibit of slitting and roll winding machines.

PERMANENT EXHIBIT AT CAMERON CO.

A permanent exhibit of slitting and roll winding machines has been arranged by Cameron Machine Company in its plant at 61 Poplar Street, Brooklyn, N. Y.

The machine exhibit proper consists of an assortment of slitting and roll winding machines of different types and sizes.

Some of the machines are of universal application, but others are of special design. There are narrow machines and wide machines, heavy duty and light duty, two drum and riding roller equipped, one rewind shaft and two rewind shaft machines.

One high-speed slitter, which operates at 1500 feet per minute, is equipped with a constant web tension mill roll control. This control relieves the operator of the necessity to make adjustments on the mill roll brake friction with changes in the speed of the machine or the diameter of the mill roll. In addition, this particular machine is equipped with an electric eye side register control, which makes it possible to take telescoped rolls and wind them up with straight ends by guiding to a printed line or to the edge of the web.

Another machine in the exhibit is a heavy duty slitter for handling double-faced waxed papers or other unevenly-coated stocks. This is a two shaft or "Duplex" machine. Rolls are stagger wound assuring positive separation while special "Differential Rewind Shafts" allow for individual tension on each rewound roll.

A splicing and roll winding machine as used in newspaper and magazine press rooms also is on display.

The newest machine in the exhibit is a Duplex slitter for tabulating card stocks. The slitter likewise incorporates a constant web tension control for the mill or parent roll.

VANADIUM CO. LITIGATION IS SETTLED

Announcement has been made by Vanadium Alloys Steel Company and Philip M. McKenna, both of Latrobe, Pennsylvania, that the litigation between them involving the McKenna patents on cemented hard carbide compositions has been settled amicably and the suit has been terminated.

Mr. McKenna has been licensed to continue in the manufacture and sale of cemented hard carbide compositions under the name of McKenna Metals Company, Latrobe, Pennsylvania, as heretofore.

◆

▶▶▶ THE GLYCO PRODUCTS COMPANY, INC., New York City, have been working for the last twelve months on producing a series of products to replace materials which can no longer be obtained or are obtainable only at a very great increase in price. This activity has been explained as being due to war conditions and the subsequent difficulties in obtaining certain materials—substitutes for carnauba wax, montan wax, beeswax, ozokerite, glycerine, etc., are now available, it was stated.

◆

HEATING AND VENTILATING SHOW BOOMS

Less than 20 per cent of the total exhibit area is now available for the Sixth International Heating and Ventilating Exposition, to be held January 22-26, 1940, in Cleveland, Ohio.

The Heating and Ventilating Exposition, known as the Air Conditioning Exposition, brings together, biennially, the leading manufacturers in this field. It deals with heating, ventilating and air conditioning in all possible applications. Exhibits cover the entire field of manufacturing "weather" indoors including displays of all of the fuels used for home heating, studies of scientific combustion, and exhibits of precision instruments and boilers, grates, burners, pipes, valves, pumps, traps, heaters, etc.

President Charles F. Roth of the International Exposition Company will again be personally in charge of the Cleveland show. Permanent headquarters are at Grand Central Palace, New York City.

◆

EXPECT LARGE ATTENDANCE AT CHEMICAL SHOW

The Seventeenth Exposition of Chemical Industries, to take place December 4-9 at Grand Central Palace, New York City, will be the largest exposition since 1930, according to indications based on the amount of space now under contract to exhibitors. Exhibits will include displays of chemicals, chemical raw materials and fabricated materials for use in many industrial operations in addition to precision instruments, process equipment and materials of construction.

The exposition will be under the direction of Charles F. Roth, president of the International Exposition Company, who has been similarly responsible for the management of these expositions since the first one was held in 1915.

◆

▶▶▶ AN ESTIMATED 500,000 cords of pulpwood will be cut within the next few months in St. Lawrence North Shore timber limits. More than half of this will go to the Baie Comeau newsprint mill.

◆

▶▶▶ THE BULKLEY, DUNTON PULP COMPANY of New York, has established a branch office in Kalamazoo, Michigan. Milton R. Bailey is in charge of the new branch and is associated with Rex Vincent, the company's Chicago representative, in handling Bulkey, Dunton Midwest sales.

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FREDERICK Centrifugal **PUMPS**

CLOGLESS FOR HI-DENSITY STOCK

CENTRIFUGAL PUMPS FOR ALL PAPER MILL PURPOSES

ASH CONVEYORS——————STOKERS

THE FREDERICK IRON & STEEL CO.

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PERSONALS

DR. BAILEY NEW MEMBER STAFF OF UNIV. OF WASH.

For many years the University of Washington has been interested in research on wood and its constituents and publications have appeared regularly from the chemistry and other departments. It is now proposed to initiate intensive research into the chemistry of wood by the addition of properly qualified research workers to the staff. The first appointment for this purpose is Dr. A. J. Bailey as Assistant Professor of Chemistry and Acting Director of Lignin and Cellulose Research on October 1, 1939, announced by Dr. Henry K. Benson, executive officer of the dept. of chemistry.

The most important contributions which the university has made to the technology of the foremost raw material in the state are undoubtedly those by Dr. Benson and his coworkers on the properties and uses of waste sulphite liquor. It is hoped that the inauguration of this new research will continue these important advances in the chemical utilization of wood constituents, and especially of lignin.

Dr. Bailey's major work was in the field of wood chemistry, his Bachelor's, Master's, and Doctor's degrees being awarded in 1933, 1934, and 1936 by the University of Washington. At the completion of his academic work, he was placed in charge

Dr. A. J. Bailey

of the wood technology group at the Institute of Paper Chemistry, Appleton, Wisconsin, and served from March to December 1936, leaving there to teach and do fundamental research on lignin at the University of Minnesota in collaboration with Dr. R. A. Gortner of Biochemistry. His research findings have been reported in more than thirty publications. A number of Dr. Bailey's articles were published in *The Paper Industry*.

The new project represents crystallization of a broad research program to develop more effective utilization of wood resources. Splendid library facilities are available in the university library to support the ultimate approach and solution of fundamental problems through the various science groups in the University, including chemistry, physics, botany, forestry, and bacteriology. This fortunate combination of sciences converging upon the use of wood as a raw material provides a powerful tool to discover and develop information valuable to the pulp and paper industry of the Pacific Northwest.

◆

OTIS ELECTED PRESIDENT OF DODGE MFG. CO.

Joseph E. Otis, Jr., formerly president of the Stewart-Warner Corporation, Chicago, has been elected president of the Dodge Manufacturing Corporation, Mishawaka, Indiana, to succeed George C. Miller, who passed away on May 10 of this year.

Mr. Otis, elected to the Stewart-Warner presidency in 1933, was, prior to his connection with the latter concern, vice president and general manager of the Alemite Corporation. He is, at present, a director of the Central Republic Company, Chicago, and the Outboard Marine and Manufacturing Company of Milwaukee, Wisconsin.

◆

R. S. MacPHERRAN TO RETIRE FROM ALLIS-CHALMERS

Ralph S. MacPherran, chief chemist of the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, for nearly fifty years, is retiring from active service with the company. Harold J. Stein, research engineer of the manufacturing department, has been ap-

CHAMPION ELECTS THOMSON-RANDALL VICE PRESIDENTS

Alexander Thomson, Jr., and Herbert T. Randall, both directors of the Champion Paper and Fibre Company, Hamilton, Ohio, were elected vice presidents of the company at a recent meeting of the board of directors.

Mr. Thomson, who has been and will continue as advertising manager, is the son of Alexander Thomson, chairman of the board, who passed away last June. Mr. Randall, who has been a director of the company for several years, is consulting engineer. He will continue in the latter post.

Alexander Thomson, Jr. (left)

Herbert T. Randall (right)

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A. C. ENGINE GENERATOR SET

500 KVA., 8 P.F., 400 KW, 240 v., 3 ph., 60 cy.

G.E. Alternator dir. con. to 22" x 30" Erie Ball 4 valve eng., 150 lb. pres., with exciter and swbd.

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Automatically Indicated and Recorded Putting Stock Freeness continuously in Plain Sight of the Workmen. For Details:

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When a Company has maintained the most rigid of production standards over a period of 58 years . . . you can rely upon its name and on its products! Scientific methods . . . exacting supervision have made SOLVAY LIQUID CHLORINE a bleaching agent on which you can depend . . . that you can take for granted will be always pure, always uniform, when you receive it!

And when you place your order with Solvay for LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . you are guaranteed fast, sure, on-time deliveries. You are relieved of worry, of check up . . . time spared for your own problems.

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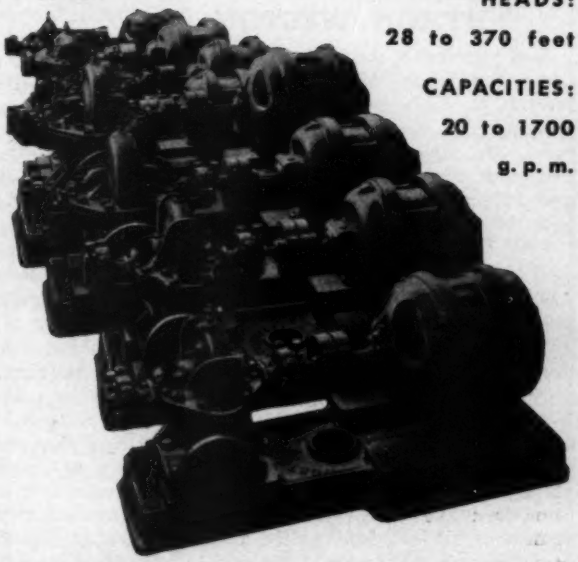

HEADS:
28 to 370 feet

CAPACITIES:
20 to 1700 g. p. m.

COMPLETE MOTOR-DRIVEN CENTRIFUGAL PUMP UNITS

Standard-fitted centrifugal pumps, direct-connected to ***3-phase, 60-cycle, 220/440 volt*** *standard electric motors*

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WORTHINGTON PUMP AND MACHINERY CORPORATION

pointed director of research, chemistry and metallurgy, of the Allis-Chalmers manufacturing department.

Mr. MacPherran is especially noted as an outstanding metallurgist in the field of gray iron. He has long been active in many technical societies. In 1931 he was selected to receive the coveted J. H. Whiting gold medal award of the American Foundrymen's Association, and as a result of his continuous valuable investigations of gray iron he has acquired an international reputation.

◆

POMEROY NOW PRESIDENT OF BYRON WESTON

Now president of the Byron Weston Company, Dalton, Massachusetts, is Brenton C. Pomeroy, formerly vice president and treasurer of the company. Mr. Pomeroy has been associated with the Weston organization since 1919 and succeeds, in his present post, the late Donald M. Weston.

John H. Bellows, for thirty-seven years associated with the Byron Weston Company, is now treasurer of the organization to succeed Mr. Pomeroy. He was formerly office manager and assistant treasurer.

◆

▶▶▶ *Arthur S. Cosler,* formerly sales manager of Bauer Brothers Company, Springfield, Ohio, has resigned his position to devote himself to the development of his own work in the field of paper stock preparation, high yield semi-chemical pulp preparation and rejects refining. Mr. Cosler, who had been associated with Bauer Brothers for the past four years, is residing in Springfield.

Arthur S. Cosler

CHEMICAL MEDAL TO DR. WILSON

Each year the Society of Chemical Industry awards a medal to the man who is distinguished for valuable application of chemical research to industry. The award this year was made on November 10, 1939, at a joint meeting of the American Section of the Society of Chemical Industry, the New York Section of the American Chemical Society, and the New York Section of the American Institute of Chemical Engineers.

The medallist honored this year is Dr. Robert E. Wilson, president of the Pan American Petroleum and Transport Company (affiliated company of Standard Oil Company of Indiana), and the presentation was attended by many well-known research men. Dr. Wallace P. Cohoe presided at the gathering and the presentation was made by James G. Vail, past chairman of the American Section.

The speakers on this occasion paid high tribute to the achievements which won for Dr. Wilson this honorarium; Dr. Bruce K. Brown, general manager of research development of Standard Oil Company of Indiana, spoke on his technical achievements, and Dr. Thomas Midgley, Jr., of the Ethyl Gas Corporation spoke on the personal side of the medallist's life.

Dr. Wilson was formerly assistant director of research of the Standard Oil Company of Indiana, later becoming assistant to the vice president in charge of manufacturing, then vice president in charge of research and development. He became associated with the Pan American Petroleum and Transport Company in 1935.

After accepting the medal, Dr. Wilson spoke to the gathering on the subject "Refinery Gases as Chemical Raw Materials."

◆

▶▶▶ Now assistant sales managers of the Norma-Hoffmann Bearings Corporation, Stamford, Connecticut, are *C. W. Hedler,* formerly manager of distributors' sales, and *R. L. Miller,* long-time member of the Norma-Hoffmann general sales staff.

◆

SERVOTTE NOW MANAGER OF BAY WEST CO.

William J. Servotte, assistant manager of the Bay West Paper Company, Green Bay, Wisconsin, has been appointed general manager of the Mosinee subsidiary, to succeed Frank P. Vaughan, who resigned recently to head and help organize Tested Papers of America, Inc., (cf. THE PAPER INDUSTRY AND PAPER WORLD, p. 642, Sept. 1939).

Wm. J. Servotte

Mr. Servotte has been acting manager at Bay West since Mr. Vaughan left and has been with the company ten years. Mr. Servotte's appointment was announced by the board of directors of the Bay West Paper Company co-incidental with the appointment of Robert M. Quigley as sales manager. Mr. Quigley has been with the company for eleven years and recently was in charge of the southern territory.

◆

E. A. WORM, JR. PROMOTED BY ARMSTRONG-CORK

E. A. Worm, Jr., assistant general superintendent of the Arrowhead (New York) plant of the Armstrong Cork Company, has been appointed general superintendent of the company's Pensacola (Florida) plant. The Florida plant manufactures Temlock fiber board insulation products. Mr. Worm succeeds A. W. Baldwin who is continuing in the capacity of consulting engineer.

Mr. Worm joined Armstrong in 1930. He graduated from the New York State College of Forestry where he majored in pulp and paper and was previously employed by the International Paper Company. The vacancy created by Mr. Worm's appointment will be filled by H. R. Huffman, plant and industrial engineer at Arrowhead.

◆

▶▶▶ RECENTLY APPOINTED head of the Blaw-Knox Division of the Blaw-Knox Company, Lawrence E. Joseph is now a director and vice president of the company.

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HOWLAND, MAINE

Plant and Equipment For Sale

75 ton Sulphate Mill

1—100" trim Fourdrinier paper machine with variable speed electric drive, ran 600 feet; with beaters, jordans, and Bird screens.

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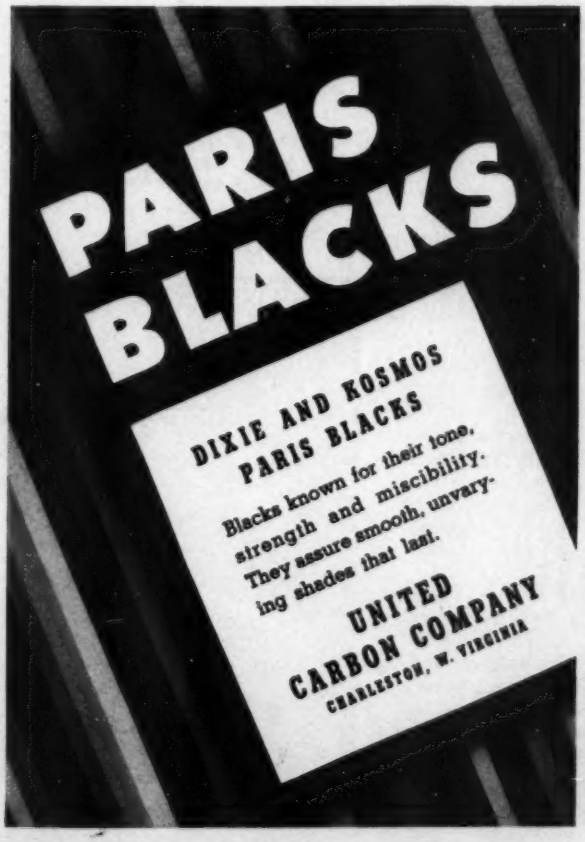
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Blacks known for their tone, strength and miscibility. They assure smooth, unvarying shades that last.
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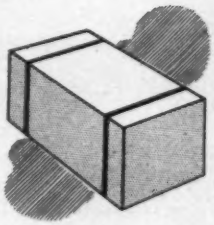
SHIPPING ROOM
Savings
With the
STANLEY STRAPPING SYSTEM



WEIGHT SAVINGS

Stanley Strapping tensions container with strong steel bands, permits lightening your container with safety. Stanley Colorgraph Strapping dresses up your cartons . . . carries your name, trade mark or sales message in brilliant colors. Identifies your product instantly.

TIME SAVINGS

New Stanley "Ace" Strapping Tool applies strapping in a few seconds. Light . . . weighs only 10 lb., 3 oz. It tightens strapping, feeds its own seals, crimps seals and cuts strapping with two easy, natural motions of the arms. Precision-built to close tolerances throughout. Unlimited take-up. Spring-fed, so it will operate perfectly in any position.

HANDLING SAVINGS

made easy with "Ace" and new Stanley "Ace" Accessories. They position the tool, container and strapping on roller conveyor or shipping bench for "production" jobs as fast as they come. Regular Stanley Accessories, or a combination, will handle most strapping jobs, or Stanley Engineers will design new ones to fit your needs.

STANLEY
TRADE MARK

Write for Folder "TWICE AS FAST"
IT'S FREE

New Stanley Folder, "Twice As Fast", describes the new "Ace" Strapping Tool and Accessories, tells how the right combination can be put to work by Stanley Engineers for savings in your shipping room. The Stanley Works, Steel Strapping Division, New Britain, Connecticut.

STANLEY STRAPPING SYSTEM

A VETERAN PUBLISHER IS HONORED

Not only the eyes of Texas, his adopted home state, but the eyes of the nation and the country of his birth were upon George Bannerman Dealey, president of the *Dallas Morning News,* when he completed sixty-five years in the publishing business last month. Mr. Dealey is in his eightieth year, but he has an amazing vigor and manifests the same interest in his chosen work that has made him perhaps the leading pioneer of the fourth estate in America.

Although Mr. Dealey is distinguished for his achievements in publishing, he has come to be recognized as one of the leading factors in the establishment of the South's first newsprint mill which is under construction at Lufkin, Texas, by the Southland Paper Mills, Inc. The accompanying illustration shows Mr. Dealey delivering the principal address at the dedication of a plaque in memory of Dr. Charles H. Herty and Francis P. Garvin when it was put in place at the Lufkin mill last May. Mr. Dealey's son, "Ted" Dealey, is vice president of the publishing company at Dallas and is a director of the Southland Paper Mills, Inc.

Rarely does the public have an opportunity to honor a man whose life has been so marked with success and

George Bannerman Dealey

achievement. At the anniversary dinner which was given for him at Galveston, Texas, by the Texas Newspaper Publishers Association, notables of the nation turned out, and telegrams, letters and messages from all over the world came to congratulate this very modest gentleman. The President of the Nation affixed his signature to a letter of congratulations. The Lord Mayor of Manchester, England, from whence Mr. Dealey departed for America as a boy of fifteen, sent his best wishes.

It was fitting this memorable occasion should take place in Galveston, for his first job in a publishing office was that of office boy with the *Galveston News.* In 1885, he went to Dallas as manager of the newly established *Dallas News.* Subsequently, he rose to manager of the entire Dallas organization, vice president and general manager of the Dallas-Galveston papers, and then at the age of 60, he was made president of the publishing company at Dallas.

▶▶▶ *Karl Freund,* formerly associated with the chemical sales division of the B. F. Goodrich Company, has been appointed sales engineer in the company's paper mill sales division, it was announced recently.

Karl Freund

◆

▶▶▶ *Stanton O. Mott,* formerly connected with the Parker-Young Paper Company, New York City, has joined the staff of the sales promotion department of the Crocker-McElwain Company, Holyoke, Massachusetts. He has been assigned to sales promotion work in New York City and surrounding territory.

◆

▶▶▶ *Edward J. Greene,* formerly assistant treasurer and purchasing agent of the Baldwin-Duckworth Chain Corporation, Springfield, Massachusetts, is now assistant treasurer of the Chain Belt Company, Milwaukee, Wisconsin. The Baldwin-Duckworth concern was recently merged with the Milwaukee organization.

▶▶▶ Now assistant to *President William J. Warner* of the Plastics Products Corporation, South Hadley Falls, Massachusetts, is *Harold B. Wickersham,* formerly of the Marvellum Company, Holyoke, Massachusetts.

◆

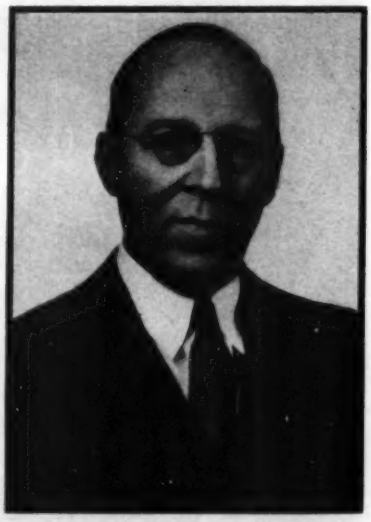
T & H EXHIBITS AT BOOK FAIR

Tileston and Hollingsworth Company's booth was one of the outstanding attractions at the *Boston Herald's* Book Fair in Boston Garden. The book fair brings authors, publishers and the public together and is designed to publicize books and printing. Outstanding American novelists included Booth Tarkington, Kenneth Roberts and Kathleen Norris. A. Hamilton Gibbs was also present.

T. and H.'s booth contained a sample of fine works done on the company's paper, but most notably attractive were the ladies from the sales office decked out in crinoline and lace of Colonial days and vice president A. V. Howland in top hat and fitting ensemble. The scene emphasized "Papers of Old Fashioned Quality," the company's slogan, as well as their 135 years of history. Also on display was equipment for making paper by hand. Paper was actually made at the fair.

◆

▶▶▶ For many years associated with the sales force of the Keith Paper Company, Turners Falls, Massachusetts, *Raymond F. Walter* has been named sales manager of the Chemical Paper Manufacturing Company, Holyoke, Massachusetts. Mr. Walter has already entered upon his duties in the newly-created position.



R. F. Walter

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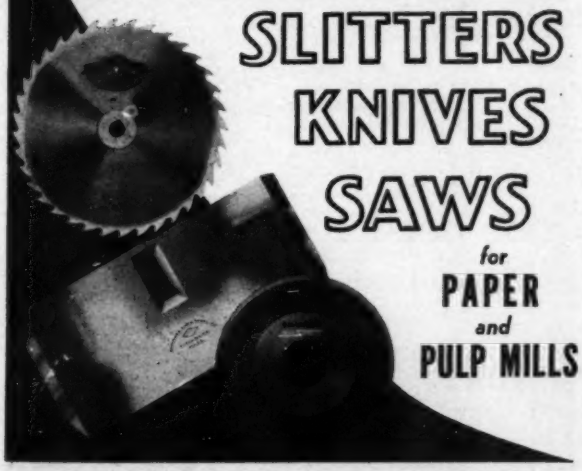
Help to Protect Your Home from Tuberculosis

CHRISTMAS SEAL SALE
1939

Thanksgiving Day to Christmas

SIMONDS



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Write nearest branch for details and prices on highest quality, smooth cutting Chipper Knives, Paper Cutter Knives, Circular Saws, Slitters and Cutters.

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IT'S A *Good Comfortable Bed!*

We made our bed some 36 years ago; we have been lying in it, so to speak, ever since; nor have we the slightest intention of occupying any other. However, we get precious little time for rest, for it's a big job we have on hand. Lindsay manufactures one line only—wire cloth. Lindsay serves only one field—the paper field—*your field.* Research goes on untiringly. Our objective is the same as yours: to develop better materials, better methods, better equipment (in particular, better Fourdrinier and cylinder wires), and *better paper.* To this end Lindsay pledges all its time and facilities and resources.

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Serving the Paper Industry Since 1903
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▪ NECROLOGY ▪

FRED HUBAND

Former general superintendent of the Gilbert Paper Company, Fred Huband, 83, passed away at his home in Menasha, Wisconsin, November 1.

Mr. Huband was born in London, England, in 1856 and came to this country in 1884. While in England he had experience in hand-made papermaking. Prior to joining the Gilbert concern in 1887, Mr. Huband worked in the paper industry at Holyoke, Massachusetts. He was also superintendent of the finishing room at the Fox River Paper Company.

Mr. Huband was made general superintendent of the Gilbert mill in 1895 and was elected to the board of directors in 1915. Because of ill health he spent the years of 1920 and 1921 in California and returned to become director of production.

◆

▸▸▸ *Herbert W. Server, Sr.*, superintendent at the Northwest Paper Company, Cloquet, Minnesota, passed away October 18 at the age of 66. Mr. Server, who had been associated for many years with the Oxford-Miami Paper Company, West Carrollton, Ohio, is survived by his widow, two sons and four daughters.

◆

▸▸▸ Well known in paper-making and financial circles, *Allan W. Macbeth*, comptroller of the Mead Corporation, passed away suddenly October 18 as a result of a heart attack. He is survived by his widow and three children.

◆

▸▸▸ *Dr. Joseph B. Lindsey*, professor emeritus of chemistry at Massachusetts State College and former head of the chemistry department there, passed away October 27 at Amherst, Massachusetts, at the age of 77.

◆

MRS. LUCY A. CROCKER

Mrs. Lucy A. Crocker, wife of Clifton A. Crocker, for many years president of the Crocker-McElwain and the Chemical Paper Manufacturing Companies of Holyoke, Massachusetts, passed away October 22 at the age of 85.

A native of Becket, Massachusetts, Mrs. Crocker came to Holyoke to live with her uncle, J. S. McElwain, and became Holyoke's first business woman when she took a position as clerk in her uncle's office in the Valley Paper Company. She married Mr. Crocker in 1881. Her husband and three daughters survive.

◆

JONATHAN BULKLEY

Senior partner of the old firm of Bulkley, Dunton and Company, Jonathan Bulkley, passed away October 17 at his home in Ridgefield, Connecticut. He was 82 years of age.

Mr. Bulkley entered the company, of which his father was the head, when he graduated from Yale University in 1879. His father was one of the early promoters of the first newsprint mill in the United States and his son did not confine his interests to the marketing field, but was also active as a director of the Oxford, Ryegate, and St. Regis companies.

Mr. Bulkley is survived by his widow, two sons, and a daughter. One son, Jonathan Ogden Bulkley, is a director in the Bulkley firm, while the other son, David Tod Bulkley, is associated with J. and W. Seligman and Company.

Better a pat on the back
while living . . . . . .

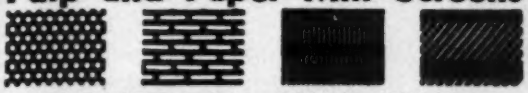
than a bucket of tears on
the face when dead . . .

★

KALAMAZOO VEGETABLE PARCHMENT CO.

Parchment - Kalamazoo - Michigan

Pulp and Paper Mill Screens



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MONEL—CHEMICAL RESISTING ALLOYS

Perforations that are accurate in size and alignment
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1—625 KVA Allis Chalmers low pressure turbo generator set, 3 phase, 60 cycle, 480/240 volts, 3600 RPM, 16 lbs. abs. or 150 lb. gauge pressure, condensing.
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2—300 KVA G. E. 3 phase 60 cycle 480/240 volt 600 and 720 RPM alternators.
9—25 KW to 600 KW 250 volt and 125 volt DC synchronous motor generator sets.
1—500 KVA Westinghouse Synchronous Frequency Changer, 3 phase, 25/60 or 60/25 cycles, 240/480/550/2300 volts, 750 RPM.
2—300 HP West. New 3 phase, 60 cycle, 440/220 volt 360 RPM slip ring motors.
1—300 HP General Electric 230 volt, 300 RPM direct current motor.

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VEST POCKET POWER PLANTS

Small space occupied, any capacity, low over-all operating costs, high and extreme efficiencies, reliability, low initial investment.
Complete power plants to meet any operating conditions of Pulp and Paper mills or other Industrial service. Engineering and Construction.
Satisfactory Services Always Guaranteed.

FERGUSON ENGINEERS
Power Specialists
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Runs at speeds up to 1500 FPM. Handles waxed, gummed, coated and plain papers of all kinds. SEND FOR ILLUSTRATED CIRCULAR.

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For high-lights of this hoist see A-E-CO POINTS (below). For full details of Lo-Hed hoists, send for our new catalog today.

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- Lo-Heds range from 1/4 to 12 ton capacities (above type available from 1/4 to 12 tons).
- Operates on Standard I-beam or track of any other hoist.
- Safe, fool-proof.
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- Heavy duty, ball-bearing HOIST motor.
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- Efficient spur-gear drive . . . and

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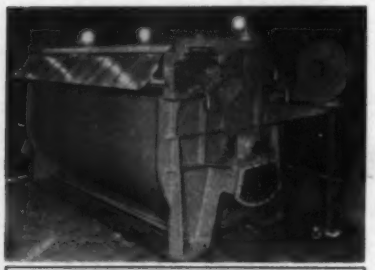
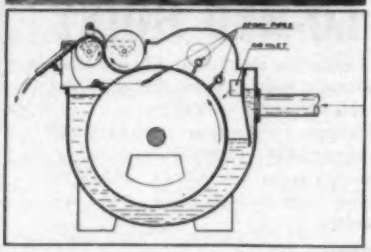
NEW EQUIPMENT AND SUPPLIES

Pressure Filter

Fibre Making Processes, Inc., Chicago, has announced its purchase of the United States and Canadian patents of a pressure filter, designed and patented by Olaf Oviller, Chief Engineer of A/S Thunes Mek. Verksted, Oslo, Norway. The filter, manufactured by Sumner Iron Works, Everett, Washington, for U. S. Pacific Coast mills, by Fibre Making Processes, Inc., for the rest of the United States, and by Port Arthur Ship Building Co., Ltd., Port Arthur, Ont., for Canadian mills, is equipped with





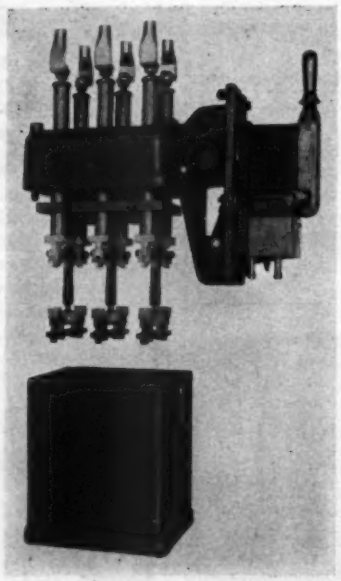
an air-tight hood over one side of the filter drum. There also is a fan which blows air into the space under the hood. The pressure developed by the fan depresses the pulp level under the hood, causing a pressure equivalent to the difference in pulp levels on both sides of the filter drum. The filter also can be supplied with a suction press roll. Present applications for the filter in Scandinavian mills include its use for the thickening of unbleached sulphite, the dewatering and washing of bleached sulphite, and as a save-all. The unit is known as the *Thune* pressure filter.

Web Press

An arc type web press that will print from one to six colors with rotary register while running has been announced by Paper Converting Machine Company, Green Bay, Wis. This press will take printing cylinders from 15 in. to 24 in. in circumference in one series and from 24 in. to 40 in. in a second series, the cylinders being set in the main frame with the tympan. The press, designed to use rubber plates, rubber plates with metal backing or metal plates, has a speed range of from 300 to 800 ft. per minute. Ink distribution in separate frames that can be racked back from the printing cylinders permits the plate cylinders to be changed quickly. The standard distributing system includes three form rolls, three vibrators, two transfer rolls, and a large standard type ink fountain.

Oil Circuit Breaker

A switchboard type oil circuit breaker, designated as type *KD-20*, has been announced by the Boston Works of Allis-Chalmers Manufacturing Company. This breaker is equipped with large butt type



arcing contacts. The main current carrying contacts are silver plated; and are of the wedge and finger type for 600 amperes, and of the wedge and laminated brush type for 1200 and 2000 amperes. The breaker is arranged for flat surface mounting or for mounting in cells, switchhouses, cubicles, metal clad switching equipment, and safety enclosed switchboards.

Flue Gas Analyzer

An automatic flue gas analyzer, known as the *Orsatomat*, has been announced by The Hays Corporation, Michigan City, Indiana. With this instrument the measuring and absorption of CO_2 is done automatically through an ingenious use of mercury. All that the operator needs to do to obtain an analysis of a sample of combustion gas is to pull out a small rod that protrudes from the side of the instrument case, aspirate the gas into the unit by means of a rubber bulb and push in the rod. The percentage of CO_2 is indicated instantly on a dial at the front of the case.

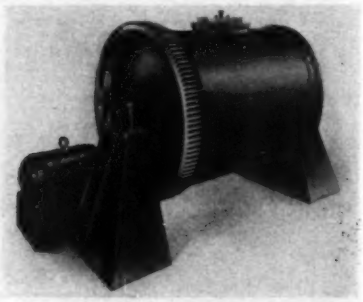
The pushing in of the rod tilts a pivoted unit, causing a column of mercury, flowing by gravity, to push the trapped gas sample into the absorption chamber (a steel-wool packed compartment freshly flushed with absorbing chemical) where the CO_2 is ab-

sorbed instantly. This absorption causes the sample to shrink, creating a vacuum which is effective on a sensitive metallic bellows connected to the dial pointer.

The instrument is finished in gray lacquer with chromium trim, and weighs 12 lb.

Ball and Pebble Mills

The H. K. Porter Company, Inc., Pittsburgh, has announced a line of ball and pebble mills. Features of this line of mills include the following: self-aligning roller bearings of high-load capacity; stands of electrically-welded steel construction; drives selected for high overhung load capacity; unlined mills constructed of high carbon

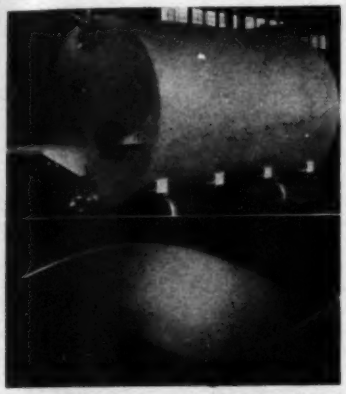


steel with a manganese content of 1.50 per cent to 2.00 per cent and having a tensile strength of over 100,000 P.S.I. and a Brinnell hardness of between 200 and 250; mills up to and including 36 inches in diameter made with seamless formed dished heads of same composition as mill body; jacketed mills, whether lined or unlined, have jacket extending over nearly 100 per cent of the mill surface; and lined mills equipped with standard, easily replaceable doors.

Stainless Clad Steel

Stainless clad steel sheets and plates, combining the corrosion resistance of stainless steel with desirable properties of mild steel, are being marketed by the Jessop Steel Company, 568 Green Street, Washington, Pa. All degrees of cladding from 3 to 50 per

cent stainless steel have been produced successfully, but the usual cladding consists of 20 per cent stainless steel. These sheets or plates are manufactured by a patented process and are known as *Silver-Ply*. It is stated that they may be bent, spun into deep



heads, deep drawn, drilled and otherwise worked with greater ease than solid stainless. Uses for these sheets and plates, which have been suggested, include cooking vessels, storage tanks and other equipment used in pulp and paper mills, as well as in other industrial fields.

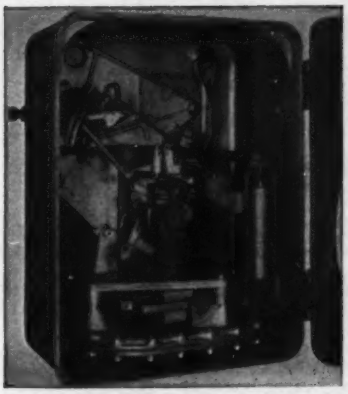
Welding Fitting for Pipe

A new type of seamless forged steel welding fitting for pipe has been announced by Taylor Forge & Pipe Works, P. O. Box 485, Chicago. This fitting, known as *Centring* WeldELL, has an annular lip forged integral with it. By firmly centering the fitting in the pipe to which it is to be welded, the lip eliminates the need for

backing rings, clamps and guides for holding the fitting in position, and is said to greatly simplify and expedite pipe welding. The fitting is full pipe thickness throughout with selective reinforcement in zones where greatest stress occurs. It also has tangents, machine tool bevels, ends marked in quarter sections and complete identifying marks as to name, size and weight.

Air Flow Mechanism for Boiler Meter

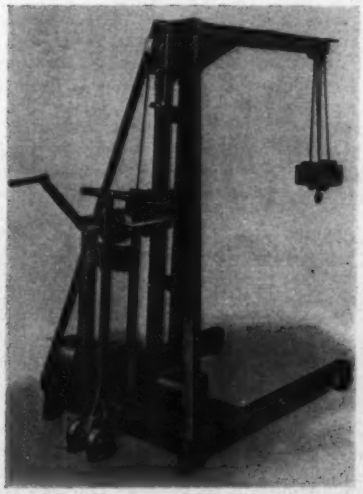
Bailey Meter Company, Cleveland, Ohio has announced the development of a diaphragm-operated air flow mechanism for its standard steam flow boiler meter. The diaphragm employed by the mechanism is clamped between flanges of a metal hous-



ing. Air flow connections from a boiler are made to this housing on each side of the diaphragm so that changes in differential pressure are measured and recorded in terms of air flow. The diaphragm is made of silk and is coated with a compound which renders it air tight and impervious to both heat and moisture. In addition to recording air flow and steam flow, the standard Bailey boiler meter also may record flue gas temperature on the same chart along with the other two records.

Portable Shop Crane

A portable shop crane, either hand or electrically operated, has been announced by Barrett-Cravens Company, 3255 W. 30th St., Chicago. Of welded steel construction, the crane is made in capacities from 500 to 5000 lb. with either fixed or revolving boom and for any desired lifting height. Boom



uprights can be made rigid, hinged or telescoping to negotiate low overhead clearances or doorways. The crane is mounted on roller bearing wheels to facilitate moving. When lifting or lowering, the front wheels are raised so that the members supporting the upright boom contact the floor, giving a firm footing.

Fence Paint

A ready-mixed aluminum paint, formulated for painting rusted chain link fence without removing the rust, has been announced by The Skybryte Company, Cleveland. This paint is said to dry from the outside, retaining a firm elasticity which makes it possible for the paint to withstand the movement of the joints without chipping. Known as *Fence-Bond*, the paint may be applied with brush or spray gun.

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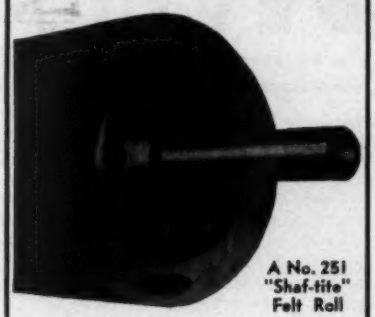

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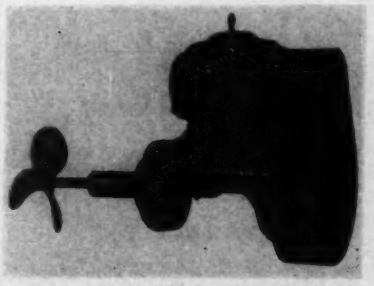
Agitator Re-designed

Mixing Equipment Company, Rochester, New York, has re-designed its *Lightnin* side-entering, V-belt, mixer. Weight reductions in the new design over the old amount to 75 to 125 lb., depending on the model. These reductions in weight are



brought about through changing from castings to fabricating. In the new design the motor is mounted on a pivoted steel platform which is actuated by a riser bolt. The rear bearing is of the cartridge type, which permits easy inspection and maintenance. Where desired, silent chain drive can be substituted for the V-belt drive.

TECHNICAL DEVELOPMENTS

The following abstracts are of the latest developments found in the foreign press.

Water Pollution Due to Sulphite Wastes

This is an article dealing with the effect of sulphite waste liquors on the chemical reactions of the water system in the Bleiloch reservoir in the Upper Saale river of Germany, and shows clearly the major difficulties that result when new projects are started without giving due study to pre-existing conditions. This reservoir is the largest ever built in Germany. It is 28 kilometers in length, and the layout is fully described, as are the conditions which have made for the progressive pollution of the entire water system because of non-treated wastes from a sulphite mill situated on the head race. This latter is much too small to balance the biological oxygen demand of the water prior to its entrance into the reservoir, which huge as it is cannot cope successfully with the difficulties. The author describes the peculiar current and flow phenomena, and illustrates them in diagrams. These, coupled with recurring hydrogen sulphide generation, and decrease of oxygen has damaged the fish life. A "sulphur cycle" is established due to the continuous discharge of waste liquors, until the entire system has become affected. The addition of an ethanol plant in connection with the sulphite mill has not helped the situation. The harmful constituents are still discharged. Even if the mill were closed down, it would probably take years to free the water from sulphur compounds. The hydro-electric installation in connection with the reservoir were made after the pulp mill had been in operation, but evidently the possibility of water pollution was ignored. Hans Liebmann. Von Wasser 13, 55-77 (1938) through Bull Insti. Paper Chem. 9, 581-2 (1939).

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A Highly Simplified Lignin Determination

The authors have determined the ratio between percentage lignin and the iodine number of many pulp, wood and straw samples. This they term the "proportional number" and they designate it as the Greek letter Ψ. The average Ψ is roughly constant in any given case for a particular type of pulp or wood. For example: it is 0.25 for unextracted sulphite; 0.26 for extracted sulphite; 0.38 for extracted and unextracted sulphate; 0.33 for the average extracted wood of German angiosperms; 0.36-0.37 for that of German gymosperms; 0.38 for the average of all non-German woods examined, and 0.33 for extracted straws. The lignin determination [according to Komarow, Bumazhnaya Prom. 12, 32 (1934)] which was used in this investigation in the case of wood requires about 7 hours. The iodine number, carried out as follows, takes only about 65 minutes. A weighed amount of bromine was added to the sample which varied in amounts depending on its history. The bromide was vaporized in the absence of light, and after acting upon the sample for a specified time, was decomposed by KI, and the free iodine titrated with standard sodium thiosulphate. Control experiments with cellulose and with xylan gave iodine numbers of zero. Because of the time saved, it was found expedient to determine the iodine number and multiply it by Ψ, which thus give the approximate % lignin in the pulp or wood. [For details of the iodine determination which involves the use of an evacuated flask, cf. Becker, Z. angew. Chem. 36, 539 (1923); Rossmann, *Ibid*, 48, 223 (1935)].

With pulps, the lignin determination was carried out with 1 gram samples, moistened with and kneaded into dimethylaniline, and after 3-4 minutes treated with 25 cc 78% sulphuric acid, with stirring. Saccharification was usually complete within 10 minutes, but tests were always made on a similarly treated sample as control, by moistening the sol with water and subsequently with 20 volumes of ethanol. If this test showed no cloudiness under these conditions, the test solution was diluted with 200 cc. hot water and heated for 3 minutes, and the lignin filtered off, washed, dried and corrected for ash. Lignin in woods was determined by a modified procedure. Attempts to compute the lignin content from the methoxyl determination were entirely unsuccessful. And the "proportional numbers" obtained by this method varied markedly from those by the one involving direct lignin determination.

Among the German woods examined were oak, linden, birch, beech, elm, maple, ash, fir, spruce, pine, larch, alder, plum, apple, pear, poplar, willow, walnut and aspen. The foreign woods varied widely in their makeup. Lignins actually isolated gave iodine numbers ranging from 192-222, averaging 204. The woods themselves showed a very wide range of iodine numbers, although the "proportional number" remained quite constant. The iodine numbers for various straws examined varied from 50.2-59.8. Although the mosses and lichens showed practically no methoxyl content, they showed appreciable iodine numbers. Here, as in the case of the ferns, there is no evident relation between methoxyl and lignin content (although the latter was not directly determined). Detailed descriptions are given of the analytical methods, and full tabulated data are included. There are over 100 literature references. Karl Kürschner and Kurt Wittenberger. Papier-Fabr. 37, Tech-Wiss. Tl. 285-94; 297-303; 305-15 (1939).

Effects of Phenols in Pine Heartwood on the Sulphite Cook

This deals with the phenolic components of pine heartwood (Pinus sylvestris), their physiological action, chemical constitution, and also their retarding action on sulphite digestion. The author extracted 3.5 kilos of the heartwood with large volumes of ether for 24 hours. He then extracted the residue with acetone, and concentrated this residue to 100 cc. This was then added to one liter of ether and the amorphous products and salts were removed by filtration. The ether solution was then shaken with 2 liters of water, and thrice shaken out with 500 cc. of a saturated aqueous sodium carbonate solution. This was followed by three successive extractions with 200 cc. each of 8% NaOH. The caustic soda solutions were acidified with sulphuric acid and the precipitate from these was dissolved again in ether, followed by absorption on alumina, re-extraction with ether, and final crystallization from benzol. This ordinarily gave about 5-6 grams of pinosylvin (A) and 11 grams of its methyl ether, although by very careful work as much as 28 grams of the combined phenols (0.8%) could be isolated. The pinosylvin ($C_{14}H_{12}O_2$) melts at 156 deg. C. and was shown to be 3,5-dihydroxy stilbene. Its monomethylether melted at 122-3 deg. C. (A) absorbs 2 atoms of hydrogen. Various derivatives of (A) and its methyl ether were prepared, identified and characterized. An important finding is that the presence of A and its ether explains the resistance of pine heartwood to the attack of fungi and

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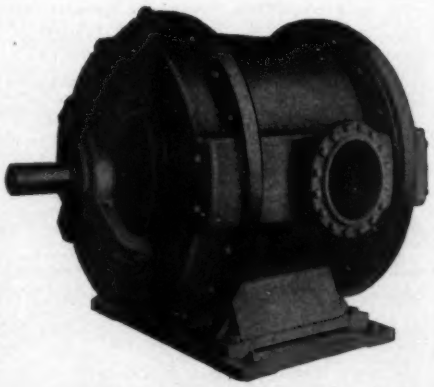

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of insects. However, A is toxic to fish, even in 0.002% solutions. Another important fact about these phenols is that they prevent the satisfactory digestion of wood in the sulphite cook. Other polyhydroxyphenols, like resorcinol, orcinol, pyrogallol, and phloroglucinol, but not pyrocatechol or phenol, show a similar behavior. A, and its ether, seem to be quantitatively bound to the lignin. They were not found in the waste liquors. Holger Erdtman. Annalen 539, 116-27 (1939); through C. A. 33, 7098 (1939).

Temperature and Consistency in Relation to Mechanical Pulp

The influence of these two factors in the grinding process and on the quality of mechanical pulp has been studied. Previous experiments gave very unsatisfactory results. Consistency seemed to exert little influence and lower power consumption and greater freeness were ascribed to higher temperatures. However, these data had been based on measurements made in the grinder pit. The grinding process does not take place in the pit but at the zone where the wood meets the pulpstone. The development of a method for measuring the consistency and the temperature in the true grinding zone is described. Both factors influence the resulting pulp quality very markedly. In turn they are dependent on the consistency and the temperatures in the pit coupled with the quantity of pulp suspension which the pulpstone carries from the pit into the grinding zone. The quantity of this pulp varies with the consistency, the depth of immersion in the pit, the stone surface, and on its speed and diameter. A lower temperature and a higher consistency, or a higher temperature and lowered consistency in the pit, may result in identical conditions in the grinding zone. Hence, pit consistency and temperature alone do not give a true index of the grinding process, unless correlated with data from the grinding zone. K. Saetre. Svensk Papperstidn. 42, 321-8 (1939) through Bull. Inst. Paper Chem. 9, 551 (1939).

Vitamin C in Conifers

Needles from the following pines all contained vitamin C: Scots pine (1.01 mg. per g.); Jack pine (1.87 mg. per g.); pitch pine (0.77 mg. per g.); N. white pine (1.64 mg. per g.); European spruce (1.58 mg. per g.); yew (Taxus baccata) (3.54 mg. per g.); mature needles from dwarf juniper (2.06 mg. per g.). Sometimes the bark of yew twigs also contain the vitamin, but this varies. Other data are given. Wladysaw Kapuscinski. Wiadomosci Farm. 65, 369-72 (1937); through C. A. 33, 5446 (1939).

Lignin Determination

Using a combination of the Ost-Wilkening and the Willstätter-Zechmeister methods, the author has devised a method for lignin determination which is based on the solubility of cellulose in a solution containing 40 grams zinc chloride, 100 cc. 37% HCl and 5-10 cc. water. After cellulosic materials have been in contact with such a solution for 4.5 hours, dilution no longer causes cellulose separation. In preliminary experiments 0.5 to 1.0 gram sawdust samples were treated with 20-30 cc. of the above solution for varying time periods, filtered by suction, washed twice with 5 cc. portions of the solvent, and then with enough cold and hot water to remove the acid. The residual lignin was dried to constant weight, and the pure lignin determined by igniting and subtracting the ash. Evidently a 10 hour treatment was adequate. The results agree very well with those obtained when lignin was isolated by the 72% sulphuric acid, and hydrochloric acid methods. This is also true for lignin determinations made on purified corncobs, wheat straw and bran straw, when compared with the sulphuric acid method. I. D. Popov. Z. Tiernähr. Futtermittelkl, 245-9 (1938) through C. A. 33, 3145 (1939).

Rice Straw Pulp

Recently a number of papers have appeared again in Japan on the pulping of rice straw. K. Agaki has shown that through alkaline cooking in a two-stage process, delignification results, but that the product, owing to a high ash content, is not suited to rayon manufacture. Kimura, in a series of articles which deal with his researches on pulping in general, claims that in the alkaline cook, prolonging the period of digestion does not lead to a decrease in this ash content, but actually causes an increase. There was no gain in pulping qualities by increasing the NaOH concentration from 1% to 2%. In general the pentosan content of the pulps was 24-25.8%. When 1% alkali was used in the digestion, after the completion of the cook (2 hours at 140 deg. C) the spent liquid was still alkaline, and this was used satisfactorily in conjunction with fresh alkaline liquor (10% on the basis of the straw used).

Under such conditions, the straw pulp, when bleached, had a total cellulose content of 88%, and retained 3.4% ash and 15.7% pentosans. Using 2 stages in the cook, gave yields ranging from 35 to 42%. The ash content ranged from 3.2-4.3%. and the lignin content from 3.3-5.0%. The best results were probably obtained, and the costs kept at a minimum, by predigestion at 140 deg. C. with waste soda liquor for 45 minutes and following this with fresh alkaline liquor (8% based on the weight of straw and 1.1% in concentration) at 140 deg. C for 2 hours. Even when the pre-cook is carried out under ordinary pressure, an improvement was noted.

There seems to be a correlation between the ash content and the strength properties. If the cook was carried out in two stages with fresh alkaline liquor, the ash content was almost 11.5%. If there was a precook with spent liquor, this dropped to about 3%. In the former case the breaking length was 1400 meters, the stretch 3.1%. In the case of the spent-liquor pre-digestion, the breaking length was 2200-5000 meters and the stretch 4.0-4.4%. Beating gave lower yields of rice pulp, probably due to subsequent losses of small and fragmented fibers. The ash content and pentosan content remained unchanged, and some lignin was always present. K. Agaki. Cellulose Ind (Japan) 15, No. 2, B11 (1939). T. Kimura. Ibid. 15, No. 3, B20-28 (1939); through Papier-Fabr. 37 Abstr. 102-3 (1939).

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of The Paper Industry and Paper World, published monthly at Chicago, Illinois, for October 1, 1939:

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. Scott Dowd, who, having been duly sworn according to law, deposes and says that he is the business manager of "The Paper Industry and Paper World" and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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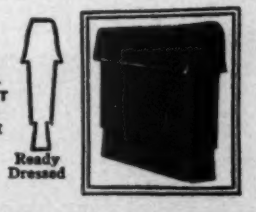

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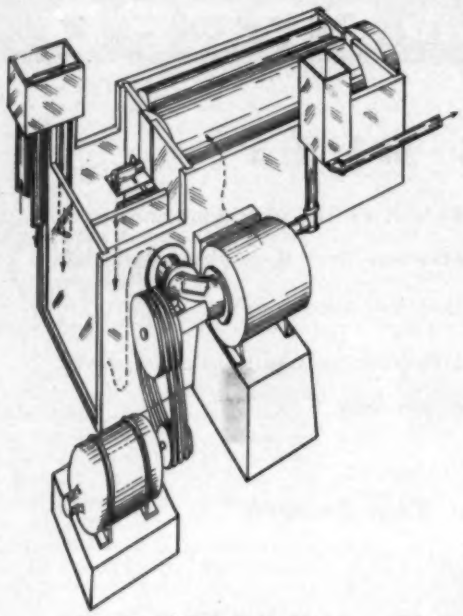

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Cameron Machine Co., Brooklyn, N. Y.—"Camachine" slitters and roll-winders are illustrated and described in a new bulletin recently published by this company.

Carrier Corp., Syracuse, N. Y.—Air conditioning for industrial applications is explained in a new booklet recently issued by this company. The booklet illustrates the various air conditioning units and shows their use for small spaces, medium sized spaces, large spaces, and low temperature conditions. Much informative data is contained in this release. The company has also published a very interesting release concerned with the varied uses of air conditioning in all types of climates. This release contains a large number of photographs showing various places of business, hospitals, institutions, theatres, homes and industries that are air conditioned.

Flexible Steel Lacing Co., Chicago, Ill.—A new line of "Alligator" V-belt fasteners is described in a bulletin (V-200) issued lately. The bulletin shows how the fasteners are applied, and illustrates various types of applications where endless V-belts could not be used without dismantling of the drives.

General Electric Co., Schenectady, N. Y.—Several new loose-leaf bulletins have been published lately by G-E. Bulletin GEA-3235 has to do with percentage differential relays for protection of a-c. rotating machines. This latter release contains much valuable data regarding the construction and operation of the relays. Another bulletin (GEA-1698A) contains information on the construction features of G-E general purpose, wound-rotor induction motors, 1 hp. and larger, while a third bulletin (GEA-1807B) illustrates and presents the outstanding features of squirrel-cage induction motors, 100 to 1500 hp.

Lovejoy Flexible Coupling Co., Chicago, Ill.—Various types of this company's flexible couplings are illustrated and described in a new release issued by the concern. The release, adaptable for inserts, contains pictures and data relative to the construction and usages of the flexible couplings. Detailed information is given through specification tables and blueprint drawings.

The Lunkenheimer Co., Cincinnati, Ohio—A very attractive and informative general catalogue (78) has been published by this company. The catalogue, bound with a red, fabric cover and stamped in gold, is 136 pages in length and contains listings and illustrations, together with extensive data regarding the valves, fittings, sprockets, oilers, cocks, grease cups, lubricators, plugs and other allied products manufactured by this well-known company. In addition to specifications and illustrations of the products, the catalogue also contains tabular matter relative to thermodynamic properties of steam in relation to saturation pressures and superheated vapor. This catalogue would be of interest and value to every pulp and paper manufacturer.

Rockwood Manufacturing Co., Indianapolis, Ind.—A handy 15-page booklet (860) covering all types of Rockwood paper pulleys has been issued recently by this firm. The book, punched for looseleaf filing, is particularly valuable to everyone interested in plant equipment and its maintenance, since it contains a complete list of stock sizes of pulleys which are always available.

Yale and Towne Manufacturing Co., Philadelphia, Pa.—A very well-done piece of catalogue work is the new release issued recently by this company. Sixty pages in length, the catalogue uses color throughout to illustrate the varied uses of the company's electrical industrial trucks, hand lift trucks and skid platforms. The release is replete with photographs and contains extensive written material on the varied features of the products. Both from the principle of layout and from viewpoint of information, this catalogue is well worth studying. It would be a thing of value in any industrial library.

BOOKS

Uses and Applications of Chemicals and Related Materials—Reinhold Publishing Corporation, 330 West 42d Street, New York, N. Y., has announced the publication of this volume. It is a work of 653 pages that has been compiled and edited by Thomas C. Gregory to serve as a guide to current industrial uses, potential applications and sales possibilities of 5,167 products. Bound in an attractive green cloth cover, with its title stamp in gold, the book lists all products in strict alphabetical order and not by chemical classification. In addition, the name of each item is given in all variants commonly encountered in English and also in the more important foreign languages. Under the heading of Sulphur, for example, are included 24 English synonmys as well as numerous equivalents in Latin, French, German, Spanish and Italian. Abelmoschus is the first product listed; zirconium silicate, the last. To this orderly arrangement of data covering so many materials is appended a helpful section on synonyms and cross references. The price of the book, which may be obtained direct from the publisher, is $10.00 a copy.

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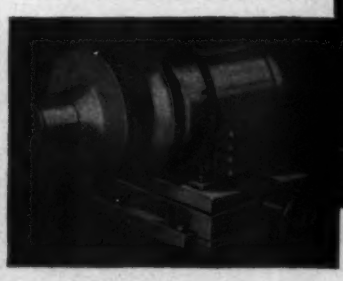
Variable Speed
MOTOR PULLEYS



CURRENT MARKET QUOTATIONS

(Owing to Unsettled Market Conditions All Prices Are Nominal)

RAGS (Domestic)
f. o. b. New York City

NEW RAGS	per cwt.
Blue Overalls	5.50 to 5.75
Corduroy	3.00 to 3.25
Cottons—	
Washables, No. 1	2.50 to 2.75
Fancy Percales	4.00 to 4.25
New Soft Blacks	4.00 to 4.25
New Light Seconds	2.25 to 2.50
New Dark Seconds	2.00 to 2.25
Khaki Cuttings—	
Mixed	3.25 to 3.50
O. D.	3.75 to 4.00
New Canvas	8.25 to 8.75
New Mixed Blacks	2.75 to 3.00
Shirt Cuttings—	
New White No. 1	8.00 to 8.25
Silesias No. 1	5.25 to 5.50
New Unbleached	8.00 to 8.25
Fancy	2.75 to 3.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS	per cwt.
Roofing—	
No. 1	1.60 to 1.70
No. 2	1.40 to 1.45
No. 3	1.30 to 1.35
Twos and Blues—	
Repacked	2.00 to 2.25
Thirds and Blues—	
Repacked	1.85 to 2.00
Miscellaneous	1.70 to 1.80
White, No. 1—	
Repacked	3.25 to 3.75
Miscellaneous	3.00 to 3.25
White, No. 2—	
Repacked	2.75 to 3.00
Miscellaneous	2.00 to 2.25

RAGS (Foreign)
ex dock New York City

NEW RAGS	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City

OLD RAGS	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING
f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	2.25 to 2.50
Domestic	2.25 to 2.50
Wool Tares—	
Light	2.30 to 2.40
Heavy	2.25 to 2.50
Bright Bagging	2.15 to 2.30
Manila Rope—	
Foreign	4.00 to 4.25
Domestic	4.00 to 4.25
New Burlap Cuttings	3.50 to 3.75
Jute Threads—	
Foreign	4.00 to 4.25
Domestic	3.75 to 4.00
Strings—	
Sisal	2.25 to 2.50
Soft jute	3.25 to 3.50
Mixed	1.00 to 1.25

WASTE PAPER
f. o. b. New York City

	per cwt.
Shavings—	
White Envp. Cuttings	2.60 to 2.85
Ord. Hard White No. 1	2.25 to 2.50
Ord. Soft White No. 1	2.00 to 2.25
Soft White, Extra	2.50 to 2.75
Flat Stock—	
Stitchless	1.00 to 1.05
Overissue Mags	.95 to 1.00
Solid Flat Book	.85 to .90
Crumpled No. 1	.70 to .75
Solid Ledger Books	1.75 to 1.90
Ledger Stock—	
White	1.50 to 1.65
Colored	1.05 to 1.15
New B. B. Chips	.55 to .60
Manilas—	
New Env. Cuts	1.90 to 2.00
New Cuttings	1.50 to 1.60
Sulphite Wrappers	.55 to .60
No. 1 Old Kraft	1.00 to 1.10
News—	
No. 1 Wh. News Cuttings	1.90 to 2.00
Strictly Overissue	.85 to .90
Strictly Folded	.60 to .65
No. 1 Mixed Paper	.52½ to .55

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	3.40 –
Ground, cwt.	3.15 –
Powdered, cwt.	3.55 –
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 45.00
Dry, barrels, pound	.0350 to .0304
Bleaching Powder—	
Drums, cwt.	2.00 to 3.00
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	20.00 to 20.50
80-100 mesh (bags), lb.	20.50 to 21.00
Argentine, lb.	18.00 to 19.00
China Clay—	
Domestic Filler	
Bulk (mine) ton	7.50 to 15.00
Domestic Coating	
Bulk (mine) ton	11.00 to 22.00
Imported (ship side)	
Bulk (lump) ton	30.00 to 35.00
Chlorine—	
Tank cars (wks) cwt.	1.75 to 1.90
Gelatine (silicin), lb.	.53 to .55
Glyc. (C.P.) drums, lb.	.1250 to .1300
Litharge, powd., bbl., lb.	.08 –
Rosin (Gum)—	
New York, 280 lb. barrel	
E, per bbl.	6.40
F, per bbl.	6.60
G, per bbl.	6.85
WW, per bbl.	7.75
Rosin (Wood), per bbl., carlots	4.00 to 6.80
Salt Cake—	
Dom., bulk (wks) ton	15.00 to 16.00
Imp. bulk on dock—	
(Atl. ports) ton	
Soda Ash—	
Bulk (works) cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—Ammonia,	
Solid, drums, cwt.	2.30 –
Ground and flake, drums, cwt.	2.75 –
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.00
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.20
Starch—	
Pearl, 140 lb. bags, cwt.	2.55 –
Pearl, barrels, cwt.	2.80 –
Paper (Sp.) bags, cwt.	2.65 –
barrels, cwt.	2.90 –
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	15.00 to 18.00
Imp. bulk, ton	
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05½ to .05½
Calcium Pig., bbls., lb.	.05¼ to .05½
Zinc Sulphide, bbls., lb.	.07½ to .07¾

CHEMICAL PULP
(Air-dry ton)

	per cwt.
Soda (Dom.) def'd. mill—	
Bleached	2.55 –
Sulphate (Dom.) f. o. b. mill—	
Bleached	2.75 to 3.00
Kraft No. 1	2.00 to 2.25
Kraft, Southern, del.	1.80 to 2.00
Sulphate (Imp.) on dock—	
Bleached	3.00 to 3.25
Kraft No. 1	1.90 to 2.15
Kraft No. 2	1.80 to 1.90
Sulphite (Dom. & For.)	
On dock—	
Prime bleached	2.70 to 3.00
Prime easy bleach	2.40 to 2.65
Prime strong unbl.	2.30 to 2.40

MECHANICAL PULP
(Air-dry ton)

	per ton
No. 1 Dom. & Can. (f. o. b. mill)	30.00 to 33.00
No. 1 Imp. (On dock)—	
Moist	37.00 to 40.00
Dry	37.00 to 40.00

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	76.00 to 82.00
Chip	45.00 –
Chip, sgl. mla. lined	57.50 to 60.00
Coated, white patent	
.016	75.00 –
.020 and heavier	70.00 –
Kraft liner	55.00 –
News	45.00 –

	per cwt.
Book (cased)	
No. 1 Glossy Coat	11.00 to 13.50
No. 2 Glossy Coat	10.35 to 11.75
No. 3 Glossy Coat	9.55 to 11.00
No. 4 Glossy Coat	9.15 to 10.50
No. 2 Offset	7.70 to 9.00
A Grade M. F.	6.50 to 8.25
A Grade Super	6.75 to 8.50
B Grade M. F.	6.00 to 7.75
B Grade Super	6.25 to 8.00
C Grade Super	6.90 to 8.00
D Grade Super	6.65 to 7.75
Ivory & India	.50 cwt. extra

	per cwt.
Bonds (Rag Content)—	
100% Rag	
Ext. No. 1	39.10 to 46.00
100% Rag	31.05 to 36.50
85% Rag	
75% Rag	23.00 to 27.75
65% Rag	20.50 to 25.00
50% Rag	17.55 to 21.50
25% Rag	14.65 to 17.75
Regular Colors	1.00 cwt. extra

	per cwt.
Bonds (Sulphite)—	
No. 1	8.95 to 11.00
No. 2	8.05 to 9.75
No. 3	7.60 to 9.25
No. 4	7.30 to 9.00
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	12.50 –
Bleached (25 lb. up)	11.50 –
Unbleach. (25 lb. up)	10.00 –
Greaseproof—	
Bleach. (25 lb. up)	10.00 –
Unbleach. (25 lb. up)	9.00 –
Ledgers (Rag Content)—	
100% Rag	
Ext. No. 1	40.25 to 47.25
100% Rag	32.50 to 37.75
85% Rag	29.90 to 35.00
75% Rag	24.75 to 29.00
65% Rag	21.65 to 26.25
50% Rag	18.70 to 22.75
25% Rag	15.80 to 19.25
Regular Colors	1.00 cwt. extra

	per cwt.
Ledgers (Sulphite)—	
No. 1	10.10 to 12.25
No. 2	9.25 to 11.25
No. 3	8.50 to 10.75
No. 4	8.50 to 10.25

	per ton
News—	
Rolls (Contract)	50.00 –
Rolls (Spot)	(nominal)
Sheets	58.00 –

	per ream
Tissues (Carlots)—	
White, No. 1	.87½ –
White, No. 2	.65 –
Anti-Tarnish M. G.	.75 –
Colored	.87½ –
Kraft	.72½ –
Manila	.60 –
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.41 –
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.43½ –
Toilet, Bleached (M shts.) per cs.	5.80 –
Toilet, Unbleached (M shts.) per cs.	3.35 –

	per case
Towels—	
Bleached	3.10 to 3.85
Unbleached	1.85 to 3.30

	per cwt.
Wrappings (Kraft)—	
Extra Quality	5.00 to 5.50
Super-Standard	4.50 to 5.00
Northern Standard	4.25 to 4.50
Southern Standard	4.00 to 4.25

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f. o. b. mill)

	per cwt.
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	6.00 –
(10,000 lbs.)	6.25 –
Drug wrapp. 35 lb.	6.25 –
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	4.50 –
No. 1 Butchers	4.75 –
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	5.00 –
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	4.75 –
Steam Finish, 50 lb.	4.12½ –
Water Finish, 40 lb.	4.50 –

	per cwt.
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	5.00 –
Envp. Mla., Sub. 16-28 (No. 2)	4.75 –
Envp. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	5.25 –
No. 2	5.00 –
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-25 lb.	5.50 –
Grade B-25 lb.	5.00 –